eReadiness Assessment of Romania

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THE MINISTRY OF COMMUNICATIONS AND INFORMATION TECHNOLOGY

Contents

Chapter 1. Introduction 4
Chapter 2. Methodology 5
2.1 InfoDev 5
2.2 eEurope and eEurope+ 6
2.3 Description of the methodology used 8
Chapter 3. The Development of the Information Society in Romania 13
3.1 Brief History of the Information Society in Romania 13
Chapter 4. Romania – Macroeconomics 22
4.1 Overview 22
4.2 The Evolution of the Main Macroeconomic Indicators 22
4.2.1 The evolution of GDP in Romania and other CEE countries 23
4.2.2 The Evolution of Foreign Trade 25
4.2.3 Foreign Direct Investments (FDI) 27
4.2.4 ICT sector development 29
4.2.5 Research Activities in the Field of Information Technology and Communications 35
Chapter 5. Summary of the Assessment using the „Readiness for a Networked World" Methodology 36
Chapter 6. Policy 42
Chapter 7. Access 51
7.1 Legal framework 51
7.2 Networks 51
7.3 Fixed line telephony 52
7.4 Mobile Telephony 54
7.5 Cable TV, Radio 55
7.6 Other services 55
7.7 Internet Availability 55
7.8 Affordability 56
Chapter 8. E-government 58
8.1 EU Benchmarking Indicators in the field of eGovernment 58
8.2 The Romanian National Electronic System 59
8.3 eGovernment Indicators for Romania – Comparative Analysis 66
Chapter 9. Education and the Information Society 68
9.1 Brief Overview of the Education System in Romania 68
9.2 ICT in the Romanian Education System 69
9.2.1 Generating ICT specialists and Mobility of Labor in the ICT Industry 69
9.3 ICT Education and Research Programs 72
9.4 Access to ICT in the Education System 74
9.4.1 ELearning 75
Chapter 10. Society 77
10.1 The Use of ICT In the Romanian Society 77
10.2 Locally Relevant Digital Content 77
10.2.1 Dynamic of the Electronic Information Update 78
10.2.2 The Civil Society Online 78
10.2.3 Portals 78
10.2.4 University and education 81
10.2.5 Virtual libraries 81
10.2.6 Mass media 81

10.2.7 Public administration 82
10.3 ICT in Everyday Life 84
10.3.1 Telephony 84
10.3.2 Technical Endowment 84
10.3.3 Public Access Points 86
Chapter 11. E-economy 87
11.1 The Use of Internet in Business 87
11.2 Electronic commerce 88
11.2.1 B2C Electronic Commerce 90
11.2.2 B2B Electronic Commerce 90
11.2.3 e-banking, the Availability of Electronic Payment Methods 91
Chapter 12. Annexes 93
Annex 1 – List of Acronyms 96
Annex 2 – E-readiness Assessment Grid using the „Readiness for a Networked World" Methodology 99
Annex 3 – List of Public Adminitration Authorities with the Obligation to Use the Electronic Procedure to Provide Public Services and Information, according to GD 1085/2003 116
Annex 4 – List of Projects Rolled out by MCTI during 2001 - 2003 118
Annex 5 – Success Stories in the Information Society Implementation Process 121
Annex 7 – List of Tables Included in the Report; 136
Annex 8 – List of Graphs Included in the Report; 138
Annex 9 – Bibliography; 140

Chapter 1. Introduction

The preset report was commissioned by the Ministry of Communications and Information Technology (MCTI), based on a USD 35,000 grant received from the World Bank, during the period July – December 2003. The readiness of the Romanian society for the implementation of the Information Society (IS) was assessed with the assistance of a Work Group set up by and under the coordination of MCTI and consisting of representatives of the main public institutions actively involved in promoting the IS in Romania (MCTI, MAI, MFP, MECT, MEC, MIE, INS, MS, ANRC), of relevant professional associations (ARIES, ANIS, ANISP, APDETIC, ACC) and of the civil society (the eRomania Gateway Association, e-democrație). An important role in the process was played by the Romanian Academy that has provided its constant support.

The consulting team, assisted by the Work Group, has considered during the assessment process both the methologies available on the InfoDev web site (according to the Terms of Reference), and, additionally, the engagements assumed by Romania within the EU integration process and included in the governmental strategy for the implementation of the IS, adopted at the end of 2002.

In relation to the information and data included in this report, numerous and various national and international sources have been consulted, debates with the specialized professional associations have been held in order to make qualified estimates, and the results of all of the above activites have been commented during the meetings of the Work Group.

The drawing up of the final report took place during the period October – December 2003 and allowed for the inclusion of indicators available at that time. Subsequently, in January 2004, Annex 6 referring to the informtion society specific indicators could be updated with the values at the end of December 2003, without updating the uderlying text in the reports.

Special tanks go to all who have supported us and have provided us information, but also useful suggestions for the successful completion of this assessment, especially the Ministry of Communications and Information Technology, the members of the Work Group, the Romanian Academy, but also to those who have welcomed the present report with their reviews.

Chapter 2. Methodology

Due to the relatively recent preoccupation of analysts, researchers and the governments for this field, to the extremely fast evolution of the ICT technologies and due to the multiple implications of the Information Society in the economical and social life of the communities and of citizens, the methodologies that have been used to assess the Information Society are numerous and involve a series of differences regarding the analysed aspects, the indicators that were used and the data collecting methods.

2.1 InfoDev

An overview of the methodologies available on different websites dealing with issues related to the Information Society reveals a large diversity of such methodologies. Practically, almost every study has introduced a new vision on how to assess the e-readiness level of a society.

The website of the World Bank project for the development of the Information Society (IS), http://**www.infodev.org**/ereadiness/methodology.htm presents some of these methodologies with general (country level) or punctual application, for the analysis of some specific aspects, the scope of which is much more restrained.

The studies aimed at performing an e-readiness assessment of a country, usually analyse the following five sections:

- Access to ICT resources;
- Education and research;
- The ICT use within the Society;
- The ICT use within firms and the Government;
- The legal framework;

The assessment of the specific indicators included in the above mentioned sections could be made from a qualitative and/or quantitative perspective, considering the development level of the information society in the respective country and its belonging to a certain group of countries.

Starting from this assessment, some methodologies give grades or qualifications in order to enable an evaluation of the evolution in time and a comparison between countries. As for the emerging countries, with low Internet penetration, or more likely in an incipient phase, with an income per capita that is too small to allow significant consumption of hardware and the appropriate technology for a secure and fast access, general qualitative evaluations are being performed in order to underline the preoccupations of the authorities, the business environment and the entire society on this matter.

Some of the most used methodologies in such evaluations are presented below:

- Computer Systems Policy Project - Readiness Guide for Living in the Networked World. The questionnaire covers the followings sections: infrastructure, access, uses and services, economy and development factors (politics, security, confidentiality and omnipresence). The

methodology's result is giving grades from 1 (minimum) to 4 (maxim) for each of these categories;

- Harvard University, Center for International Development – Readiness for the Networked World: A Guide for Developing Countries. The questionnaire assesses the following sections: access, education, society, economy and politics. The methodology's result is giving grades from 1 (minimum) to 4 (maxim) for each of these categories;
- Asian Pacific Economic Cooperation (APEC) Electronic Commerce Steering Group. There are six sections to be assessed: infrastructure and technology, access to networks and communication services, the use of internet, promoting and support, human resources, the openness of public administration, consumers and business sector to eEconomy. The result of the questionnaire is an e-readiness evaluation for each section, without generating a general score.
- McConnell International's Risk E – Business: Seizing the Opportunity of Global E-Readiness. Five sections are measured: connectivity, e-government, information security, human capital, e-business climate. The analysis' result is giving the country grades from 1 to 3;
- Mosaic's Global Diffusion of the Internet Project. The following sections are being analysed: the number of Internet users, the geographical expansion, the use of Internet within the main economical sectors, the infrastructure, the Internet services offer, the complexity level of the Internet use. The result is presenting the level of Internet development from all 6 points of view mentioned above;
- World Information Technology and Services Alliance's International Survey of E-Commerce. The survey analyses the companies' experience in using the internet regarding the problems encountered in the ICT industry, the role of the consumers confidence, the problems related to the to the e-commerce technology, the international practices related to the e-business, the problems related to the labour force, the fiscal system, the public administration politics etc. The result of the application of the methodology is not exactly an assessment, but a list of problems and proposals for the environment development;
- Crenshaw & Robinson's Cyber-Space and Post-Industrial Transformations: A Cross-National Analysis of Internet Development. The following sections are being analysed: the technology development level, the society's democratic level, the educational system, the existence of an important services sector, the telecommunications penetration, the foreign investments, the ethnical homogeneity, differences between economical sectors, demographic density and the exports level. The result of applying the methodology is presenting the collected statistical indicators and trying to explain the key factors of the level of Internet use in the analysed countries.
- Leland Initiative Telematics for Africa project al Center for International Development and Conflict Management from the University of Maryland – Negotiating the Net Model. This methodology analyses the following: the social, political and economical context, the main players for internet development, the policy of promoting the Information Society.

In order to select the methodology for assessing the Information Society in Romania, we have to consider the country's present situation, being at the border between an emerging country and a developed one, and also the belonging to the group of candidate countries to the European Union. As a candidate country in the process of negotiation of the *aquis communautaire*, Romania has assumed certain obligations related to Information Society in respect with the legal, institutional and statistical framework. Therefore, along with the other 11 countries from CEE with the same status, Romania has adhered, starting 2001, to the eEurope and eEurope+ programs presented briefly in the following section.

2.2 eEurope and eEurope+

At the beginning of the years 2000, the impact of IT&C development on the economical progress registered by some countries, and especially the USA was obvious and determined

most of the other developed countries to acknowledge the importance of the ICT sector as well as of the knowledge based economy.

Therefore, in order to reduce the existing gap between the EU and the USA, the European leaders, gathered in Lisbon in March 2000, have adopted a Statement, committing themselves to transform the EU into "the most competitive knowledge based economy by 2010, capable to sustain economic growth by creating new jobs and by the existence of an increased economic cohesion", thereby launching the *eEurope* program. This Statement of principles and objectives included, among others, the increase of the employment rate from 61% in 2000, to 70% in 2010 and an average growth rate of the EU of 3%, higher than the level of 2.1% reached in the last decade of the 20th Century. In order to achieve these objectives, the EU country leaders have also adopted an Action Plan that scheduled, for some of them, extremely short deadlines (the end of 2003), as they have been identified as fundamental for building an information society in Europe.

Basically, the European Commission aimed, through its objectives, at supporting the widespread use of Internet. Thus, it is desired that the e-economy contribute to the economic development by initiating new activities and increasing the productivity of the existing ones, generating as a final result the modernization of the European economy.

Considering the technological divide and the population's differences in level of income of the population among the EU countries and in the CEE Candidate Countries, the latter ones have adopted separately an action plan named *eEurope+* (2001) taking over the basic objectives of the eEurope program:

- Ensuring electronic communication for every household, school, plant and public administration institution;
- Creating a European digital and entrepreneurial culture;
- Respecting the principle according to which the transition to the digital era must involve the entire society, gain consumer trust and strengthen social cohesion,

and added the objective of ensuring the fundamental elements for the transition to the Information Society, i.e. supplying of the necessary infrastructure.

In order to measure the progress in achieving the objectives mentioned above, the European Union has recommended a set of indicators to be annually determined by the National Statistics Office of every country that adheres to these programs. Moreover, the EC recommendation regarding the comparative studies of the IS indicators for each Member State and each Candidate Country is to use in an increasingly productive way the statistical surveys' results. The National Statistics Offices should update their information collecting methods in order to deliver the indicators in due time.

In 2002, two years after the *eEurope* and *eEurope+* - for Candidate Countries – programs were launched, the Action Plan adopted in order to ensure the achievement of the assumed objectives was changed. While initially, the efforts were focused especially on adopting the legal and institutional framework, essential for supporting the transition to IS; in May 2002, the EC adopted the eEurope 2005 Action Plan, thereby setting out precise objectives in order to accelerate the IS development in Europe by 2005, considering also the EU expansion from 15 to 25 countries. Simultaneously, the EC also proposed a set of indicators that should be used by every country in order to characterize the IS development level as follows:

- Indicators concerning the level of Internet usage:

  Citizens' access to and usage of Internet

Companies' access and usage to/of Internet
Internet access cost

- On-line public services

E-government
E-education
E-health

- A dynamic e-business environment

On-line commerce
Level of Internet usage in business

- A secured infrastructure/ broad band communications coverage

2.3 Description of the methodology used

In February 2000, Romania has launched the negotiation process for EU integration. Within this context, during the period 2000 - 2003, the Romanian Government has opened all the negotiation chapters that form the *aquis communautaire* (31), including Chapter 19, which refers to Information Technology and Communications. Through the Position Document, which was the negotiation base of this Chapter, Romania has engaged to adopt all the EU regulations in this field by January 1, 2007 – the integration date. Moreover, along with the other candidate countries, Romania has adhered to the eEurope+ program (when the 10 Candidate Countries will join the EU in May 2004, this program will become obsolete) and initiated the necessary assessments in order to quantify the indicators included in this document, essential for characterising the Romanian society from the point of view of transition to the Information Society.

Thus, according to EC recommendation, the use of Internet by Citizens is measured by 2 other indicators as follows: (i) Percentage of households/number of persons that have Internet access from their homes and (ii) number of persons that use Internet regularly. These persons are defined as being between 16 and 74 years old and using the Internet at least once a week, regardless of the access point. Although this definition was included in the EC recommendation especially for the purpose of performing multi-country comparisons and underlining the best practices related to the national policies, every consultant and country adopted, from case to case, various definitions to characterise the Internet user. Various studies consider that in order to appear in statistics one person must be older than 11 and access the Internet at least once at every 3 months. Other governments consider that statistics should include only persons over 15, who access the Internet at least once a month etc. In Romania, the government, the civil society and the non-governmental societies have not yet reached an agreement concerning this matter.

This is also one of the reasons that lead to a high relativity of the studies and surveys. Practically, the values are relative and may differ significantly due to the computing method and the users' profile. According to the CEE's recommendation, these indicators should be computed annually by the national statistic institutions and reported to Eurostat. In Romania, the National Institute of Statistic carries out annually a comprehensive survey related to the IS development level, but the main problem is that the survey becomes public one year after the data collection when, practically the respective indicators are no longer actual and can hardly

be used by the government in the decision making process. In fact, they remain only as a statistic document, marking the fulfilment of an assumed obligation in the adhering process. The European Commission has suggested to the member states to set up statistical data collecting mechanisms so that the necessary information would be available in no more than 6 weeks after the survey has been carried out.

A first step in this direction has been made by the Ministry of Communications and Information Technology (MCTI) along with the National Institute of Statistic (INS), that have launched this autumn (2003) the program named e-statistics, presented in detail in the E-government section (Chapter 8 of the present report).

As for the indicator referring to the rate of Internet use of the firms, it should be classified according to the company's dimension (small, medium and large – the same as the Romanian classification, in correlation with the activities performed by the economical agents – CAEN). One should add to this, the percentage of the companies with Internet access, that own a web page, that use for communication an Intranet or Extranet network (VPN) and also the percentage of the employees that work mostly outside the office, but do access the IT system of the company.

Concerning Internet access' cost, it is recommended that it should be distinguished on different hour segments and subscription types, for example for 20/30/40 hours/month on any type of connexion, including broadband.

Within the first eEurope program, for the public services and information available online and named generically "e-government", a set of 20 basic services that should firstbecome available online have been identified (these services are presented in detail in the e-government section, Chapter 8 of this report). In addition, European programs include the recommendation to measure the percentage of the population and of the total number of active firms that use this form of communication with the authorities. At the same time, it is important to follow up the number of the basic public services fully rendered online and also the percentage of public acquisitions made fully online from the point of view of the total value. In the evaluation process of the public administration's digitisation, the employment of open source software plays an important role, since the online services must be accessible to a large number of people regardless of their income levels.

Concerning the online education (e-learning), the most important indicator is the number of computers within the schools/high schools/universities and the number of education institutes connected to the Internet. In addition, EC recommends the computating of statistics related to the percentage of the companies using the Internet in the employees' training.

As for the e-health section, an important indicator is considered to be the percentage of population older than 16 that uses the Internet in order to search health-related information. The number of doctors keeping electronic evidences of the patients and their affections, is also important.

In order to create a business environment oriented towards the extensive use of the Internet and to estimate the progress made in this direction, EC suggests to determine the percentage of the companies which use e-commerce in their activity and afterwards to determine the weight of the income resulted from e-commerce in the total income. The definition refers to those companies that have electronically ordered goods and services, have taken orders, made payments and cashed invoices online in the last 3 months.

Concerning the business environment, the EC has proposed the adoption of an index which describes the business environment's level of readiness for the IS and takes into consideration

the following parameters in different proportions: (i) the percentage of companies owning a website, (ii) the percentage of companies using at least 2 security controls, (iii) the percentage of employees using a computer on their daily activity (at least once a week), (iv) the percentage of companies that have a broadband internet connexion, (v) the percentage of companies that have a Local Area Nework (LAN) using the Intranet or the Extranet for internal communication, (vi) the percentage of companies taking orders online, if the sales value exceeds 1% of the total orders, (vii) the percentage of companies that have their own IT systems connected to the clients or suppliers IT systems, (viii) the percentage of companies using the internet for financial and/or banking services, (ix) the percentage of companies that sold their products through the Internet electronic markets.

Regarding network and transaction security, the European programs recommend determining the percentage of the Internet users that have encountered security problems like credit cards fraud, viruses and unauthorised use of personal information, email unauthorised access etc. In addition, for private persons and companies, the percentage of users that installed security systems on their personal computers or that updated the existent one in the last 3 months before the survey date can be determined.

Regarding the broadband communications, it is indicated to determine the percentage of companies and households having such Internet access and also the percentage of broadband connections (defined as connexions with a high speed access like cable, satellite, radio, UMTS, LAN, xDSL etc) available in public administration.

In order to obtain comparable information about the indicators mentioned above, Member States have been recommended that by 2005, when the Action Plan will be updated according to these results, the surveys should be carried out annually in October, having as a reference the first quarter of the year.

At the same time, during the period following 2000, from a macroeconomic point of view, important steps were made by Romania in order to achieve the status of “developed country”, objective set for 2005, the expected date for Romania to become an OECD member (details about macroeconomic evolutions in this period can be found in the section with the same title).

Therefore, it can be considered that Romania is presently at the border between an emerging country and a developed one, so that quantitative e-readiness assessments solely can not be considered as a sensitive instrument of measurement, capable of providing a detailed image for stressing the areas where efforts need to be made both by the authorities and by the society, in order to reduce the distance from the EU average. In the same time, Romania is not yet a developed country so that all the indicators included in the eEurope program to be assumed by the Government through the GD 1440/2002 regarding the adoption of the Strategy for promoting the New Economy and IS implementation. Although, in some aspects, sustainable actions have been taken and precise results have been achieved which can be used to add value to the decision making process in order to stimulate the adoption of the specific mechanisms of the Information Society.

Practically, the methodologies presented on the InfoDev website have a common point in the groups of parameters used for the performance assessment of a society from the Information Society point of view. These are: (i) Policy, (ii) Access, (iii) Education, (iv) Society, (v) Economy to which, in our opinion, should be added a distinct group which can be found in each of the five sections mentioned above – eGovernment. Depending on the methodology used and the authors of the studies, these groups can be characterised using quantified indicators. In most cases, the grades have been assigned based on an evaluation grid. Such an

assessment has been performed by our team, based mainly on the "E-readiness for a Networked World" methodology, created by Harvard Centre for International Development, available on the InfoDev website (presented in Annex 2 of this report) together with the results achieved in a similar assessment process which took place in 2001. The significant progress that Romania has achieved in the last 2 years in developing and implementing the Information Society specific work instruments is obvious. At the same time, looking at the above mentioned methodology and, generally, to quality or grid-based assessments specific to emerging countries, it is easy to observe that in Romania's case substance analysis cannot performed because, as the results shows, on the monitored sections a relative maximum has been reached. However, such maximum values are relative, not absolute if the indicators quantified in Chapters 7 thru 11 are compared to the average values of Candidate Countries or to other CEE countries.

At the same time, someof the indicators mentioned in the initial eEurope program are not yet relevant for the present development stage of the Romanian economy and society (inexistence of a network of highways, of a sound mechanism of collecting information regarding the environment, lack of a culture that would lead to the development of electronic commerce etc.). On the other hand, as far as access is concerned, due of the high degree of mobile communication and Cable TV penetration, both in rural and urban regions, the necessary infrastructure for the IS construction does exist as it was defined by the EU documents presented in the section dedicated to eEurope and eEurope+ program. At the same time, in the last 2 years, at the governmental level, remarkable progresses have been achieved, and the "boom" of the e-government allowed the European indicators to become relevant in this case.

According to the Terms of Reference and to the usual practice in this field, MCTI created a Working Group gathering representative institutions (government agencies, specialised associations and civil society associations) that assisted us during the assessment by providing, whenever possible, the necessary data and information. At the same time, the National Institute of Statistics was completing an annual survey related that also referred to a part of the indicators that define the stage of implementation of the IS in accordance with the engagements assumed by adhering to the eEurope program. Moreover, during the very same period, ANRC was completing the survey on the wholesale telecommunication market and MCTI was performing its own survey related to the ICT use among public administration and internet service providers.

However, in spite of sustained endeavours, most of the indicators recommended by EU programs could not be quantified due to the limited availability of credible information sources. The professional associations do not yet dispose of the necessary abilities to collect relevant data and information from their members and to become alternative sources of information to the government, the specialized ministries have not yet set mechanisms that could ensure direct contact with the business environment with regard to the IS indicators recommended by the EC, whereas the National Insitute of Statistics did not dipose of a distinct budget allotted for carrying out an independent survey exclusively on eEurope.

Therefore, a great deal of the time dedicated to the present study was used up to indetify additional sources of information, to combine together the data that could be obtained and to ensure comparability of such data to European references.

During the first meeting of the Work Group, we proposed that a hybrid methodology be used, takeing into consideration the indicators included in the eEurope program, along with the assessment grid developed by the Center for International Development of Harvard University presented in Annex 2, considering the current stage of macroeconomic

development in Romania, its statute of EU candidate country in the process of negotiations of the *aquis communautaire*, the obligations it has assumed in this process on ICT field (negotiation Chapter no. 19), the methodologies presented on InfoDev, as well as the statute of still an emerging market of Romania.

Thus, within the Work Group, the eReadiness assessment of Romania was decided to be approached under the following sections:

1. Policy
2. Access
3. Education
4. eGovernment
5. Society
6. eEconomy

It was agreed that these sections would be characterised, wherever possible, from the IS point of view by means of the existing indicators in eEurope. Moreover, the members of the Work Group actually represent institutions and organizations that in the future will become real time sources of information for characterizing indicators determined at European level in order to describe the development stage of the IS in each member state. However, as it has become evident during the preparation of the present study, as of now, there are no mechanisms in place at the level of public institutions, professional associations or INS for the collection and processing of data and information necessary to characterize the IS development stage in Romania, although there are some initiatives in the field.

Chapter 3. The Development of the Information Society in Romania

3.1 Brief History of the Information Society in Romania

Starting with 1990, Romania has been undergoing a profound transformation process in order to shift from a centralized type of economy to the implementation of the principles of a functional market economy. One of the fundamental objectives of the economic reforms was the modification of the structure and weight of the contribution of the main sectors of activity to Gross Domestic Product formation.Promoting the Information Society has represented, at conceptual level, a permanent concern during the transition and economical restructuring period undergone by Romania and has been reflected in the adoption of several legislative acts in this field. Thus, one of the first normative acts in this respect was Government Decision no. 548/ May 17th 1990 which approved the realization of a unitary information system for the population evidence in counties and Bucharest, followed by Government Decision no. 1366/ December 29th 1990 regarding the roles and responsibilities in the process of promoting IT within the Romanian society, this process being recognized as "an essential component of any efficient market economy integrated in the international context". This normative act set as priorities in the informatization process of the Romanian society, the informatization of public institutions and of the state owned companies in the following fields: science, education, culture, social security, banks […], transportation, communications, energy, customs, environmental protection, local administration etc". Government Decision 1366/1990 was followed by the adoption of Government Decision no 490/ July 16th 1991 regarding the general framework of promoting IT within the Romanian society, which has introduced a methodological approach based, with special focus on the three main fields it identified: social, economical, national defence and security, as well as a split of the process into stages and an estimated quantification of the financial effort entailed by each such stage.

Within the same context, the government adopted Decision no 308/ June 23rd 1997 regarding the national IT promotion strategy which acknowledged, for the first time, the necessity to accelerate the completion of a national IT infrastructure, as "a top priority strategic goal of the social and economical development and of the European Union and NATO integration process". Government Decision no 308/1997 was the preceding document of the first "National ICT Strategy and Accelerated Implementation of the Information Society", approved by Government Decision 58/1998.

The measures adopted by Romania for implementing the IS concept were marked by the launching of Romania's negotiations to join the European Union, in February 2000 and implicitly, by the negotiations on Chapter 19 of the *acquis communautaire* regarding the field of Telecommunications, Postal Services and Information Technology. Thus, Romania has undertaken the engagement to conclude the preparations for joining the EU by January 1, 2007 and has fully accepted the *aquis communautaire* for telecommunication, postal services and IT, as the negotiations with the European Commission in this field have been finalized since 2002. The reports of the EC regarding the state of Romania in the process of adopting

and implementing the *acquis communautaire* have indicated an obvious progress in the field of ITC, as shown in the following table:

Table 1. Synthetized Conclusions of the EC Country Reports on Romania during 2000 – 2003 Regarding Chapter 19 (ITC)

The Report for 2000	The Report for 2001	The Report for 2002	The Report for 2003
No significant progress in the implementation of the *acquis communautaire* in the field of telecomunication. Additional efforts are required in order to develop the appropriate regulatory framework.	Limited progress was recorder with regard to the harmonization of the legislation in telecommunications. However, the preparatory actions undertaken should facilitate future reforms.	Significant progresses have been recorded in transposing the *acquis* in the field of telecommunications and in preparing the liberalization of the communication and postal services market. Future efforts should be directed towards developing the newly entablished administrations within an independent and truly efficient body.	The negotiations regarding this chapter (19) have been temporarily closed. Romania did not require any transition measures. Generally, Romania has fulfiled the engagements it has assumed within the accession negotiations process.. Significant progress has been recorded since the previous report, especially with regard to the setting up the legislative framework, the liberalization of the telecommunication market and the implementation of the new *acquis*. The following steps should focus upon the implementation of the legislative measures regarding the rights of users and the universal service.

At the same time, Romania was invited to join NATO at the Prague Summit, in November 2002, whereas the Protocol on Romania's accession to NATO was signed in Brussels in March 2003, which will oblige Romania to assume other engagements in the field of ICT in sectors that are relevant for the cooperation with other NATO member states.

Within this context, the development of ICT, has gradually become an important preoccupation of the decision factors in the Romanian economy, as the determinant role

played by the shift to an IS in the improvement of the living standards of all its citizens, in increasing in labour productivity in companies as well as in creating a more competitive business environment, favourable for the development of an economy based on efficiency, is unanimously recongnized.

The ICT field has benefited, even since early 1990s, from the establishment of a relevant institutional framework. Thus, the promoter of the efforts of implementing the IS in Romania is, currently, the Ministry of Communication and Information Technology, the functioning statute of which is regulated by Government Decision no 744/2003 regarding the organization and functioning of the ministry which stipulates the following main roles and responsibilities for MCTI:

- The ellaboration of strategies in the field of electronic communications, postal services, informational technology and IS related services as well as of Action Plans for the implementation of these startegies;
- The monitoring of the accomplishments of action programs regarding the realization of sectorial strategies;
- The elaboration of regulations in the abovementioned fields;
- The regulation and supervision of electronic commerce and electronic signature together with promoting the Internet access;
- Ensuring financing for a coherent development of the national informational infrastructure of the central public administration;
- Initiating, organizing, financing, monitoring, implementing and operating the projects and programmes for promoting IT within the governamental structures;
- The ceritification of long distance payment instruments as Internet banking, home-banking or mobile-banking.

Furthermore, through the Emergency Ordinance no. 64 of 28 June 2003 for instituting some measures regarding the establishing, organizing, reorganizing or functioning of some structures of the governmental institutions, MCTI was designated to initiate, lead, monitor, implement, operate and finance the projects and programs for the digitization of central administration. As a result, the Department for the Public Administration Digitization was set up as part of the Ministry.

Adoption of the regulations included in the acquis communautaire has led to the setting up new institutions as follows:

- The National Authority for Regulation in Communications (Government Ordinance no. 79/2002), the main role of which is to apply the national policy in the field of electronic communication and postal services; but also to protect the rights and interests of the users of electronic communication and postal service networks, regarding the transparency of the suppliers towards clients with respect to prices and service utilization norms, as well as regarding the processing of private data and ensuring the framework of exercising the right of all Romanian citizens to universal service;
- The General Inspectorate for Communications and Information Technology (Government Decision 180/2002) – public institution with legal personality, financed entirely from extra-budgetary funds, with supervisory and control attributions of the activities in the field of communications, as well as attributions related to the implementation at national level of electronic administration projects, according to the

national strategy in the field of IT, attributions related to the management of non-governmental radio electrical frequency distribution, monitoring the spectrum of radio electrical frequencies non-governmentally distributed, technical control and the certification of the conformity with the technical norms in the field of electronic communication, supervision and control of activities undertaken by electronic means, the operation of the PPES (public procurement electronic system) and implementation, at national level, of electronic administration promoting projects;

- The Supervisory Commission of the Functioning of the PPES (Government Decision 179/2002) for an efficient deployment of the PPES, as well as the analysis and evaluation of PPES functioning, This supervisory body ensures the framework for respecting the principles of free competition, as well as for an efficient utilization of public funds, transparency, equal treatment and confidentiality of operations, it solves litigations related to the PPES, and it validates the rules and procedures established by the system operator;

These institutions have joined the Romanian IT Promoting Group (GPTI), set up by Government Decision 271/2001, the main attributions of which refer to setting up strategic directions for implementing the IS in Romania, as well as to approving important projects in the ICT (which require financing of over EUR 100,000 per project).

Some of the most important normative acts, harmonized with the European legislation, which draw the general action lines in process of implementing the IS in Romania are the following:

- Government Decision no. 1007/2001 – for approval of the Government Strategy regarding the promotion of IT in the public administration;
- Government Decision no. 1440/2002 – for approval of the National Strategy for promoting the new economy and implementation of the IS;
- Law 161/2003 – regarding certain measures for ensuring transparency in the exercise of public duties, of public positions and in the business environment and for prevention and sanctioning of corruption.Government Decision 1007/2001 for approval of the Government Strategy regarding the informatization of the public administration (IAP) introduces the concept of "e-Administration". Practically, the objectives set by this normative act for the implementation of the IAP concept are the following:

- Promoting IT for the provision of the services that have as beneficiaries citizens and companies, which often implies integration of services provided by the central and local public administration authorities;
- Ensuring IT based access to information for final users of services of the central public administration authorities;
- Promoting IT within the internal activities of the local and public administration, as a means of increasing operational efficiency.

Some of the methods set by Government Decision 1007/2001 for achieving these objectives, are the following:

- respecting the principle of local autonomy and equality of all central and local public administrations in the field IT cooperation;
- the introduction of the *front-office* concept as interface for public services and *back-office* represented by the processes and activities that are to be performed by the public administration bodies in order to supply the respective public services;

- the setting up, within The Ministry of Administration and Internal Affaires, of a permanent unit - the Project Management Unit - in charge of implementing the Government IAP strategy .

Government Decision 1440/2002 for the approval of the National Strategy for promoting the new economy and implementing the IS starts by acknowledging that the shift to "an IS is one of the strategic objectives of the Romanian government during the period 2001 – 2004 and one of the prerequisites for accession to the EU". Thus, GD 1440/2002 admits that achievement of the objectives set out by the *eEurope+* program requires constant political commitment on the part of the Candidate Countries, given that the implementation of the *aquis communautaire* in the national legislation is no longer sufficient to progress in the way to implement the IS and reduce the existing gap between such states and EU Member States.

Thus, the measures proposed by the GD 1440/2002 overlap the ones set by the *eEurope+* program, but they extend the deadlines set for their application to the period 2006-2010. The strategy revision is supposed to become an annual process in order to reflect the technological developments of the moment as well as the new European policies, considering that, due to the EU integration perspective of 10 Candidate Countries in May 2004, starting with 1st of January 2004, the *eEurope+* action plan and the *eEurope2005* action plan will merge.

The main measures adopted by the government in GD 1440/2002 for the implementation of the IS in Romania, which illustrate the preoccupation of the government for this subject and the incorporation of the eEurope program and its related Action Plan, are presented below:

1. The consolidation of the national information infrastructure and of the ICT industry.
    a. The supply of communication services on a large scale;
    b. The development of the national ICT product and service industry;
2. Accelerating the construction of a basis for the IS, through:
    a. Ensuring cheep and quick access to Internet;
    b. Developing fast networks for research and education;
3. The education and training of human resources for the IS:
    a. The education and training of youth for the IS;
    b. Working in the knowledge based economy;
    c. Creating conditions for a non-discriminatory use of ICT specific services;
4. Simulating the achievement and utilization of IS specific services:
    a. Accelerating e-Commerce;
    b. E-Government, electronic access to public services (G2C, G2B, G2G, G2E);
    c. ICT based medical services;
    d. Stimulating the creation and dissemination of information and knowledge by electronic ways;
    e. intelligent transport systems;
    f. environmental control;
5. achieving network security, promotion of smart cards and ICT fraud control

a. computer networks security

b. communication systems security planning;

c. e-Commerce and smart cards.

For each of the five main directions identified by the aforementioned strategy, specific implementation actions have been identified, as well as the institutions in charge and completion deadlines.

The government strategy for implementing the IS in Romania is based on the principles of information sharing and equal participation of all the components of the society: Government, private sector and the civil society. By adopting these strategies, the government aims at stimulating the development of the Romanian society as a whole, mitigating the existing digital divide between the rural and urban areas, given the differences in connectivity and in the level of readiness for the implementation of the IS between these areas.

One fundamental component of the IS implementation process in Romania is represented by IAP is presented below, in Table 2:

Table 2. The Action Plan for e-administration

No.	Project Title	Purpose	Term
1.	The E-Administration Plan	Creation of the unit for setting up the IT promotion strategy in the public administration	Q IV 2003
2.		Consolidation of the short and medium term action plan	Q. I – IV 2003 Q. I 2004
3.		Elaboration of the Communication plan	Q. I – 2004
4.		Feasibility study of the national network	Q. II – 2004
5.		Specifications of the requirements of the applications for basic services	Q. II – 2004
6.		Creation of the Permanent Unit for Program Administration	
7.	Creation of the national information technology network	Achievement	Q.IV – 2003 Q. III – 2005
8.	Information portals	Feasibility Study	Q. IV – 2004
9.	Unique portal for juridical-legislative information	Active service (available)	Q. IV – 2004
10.	Database of the Ministry of Justice	Active service (available)	Q. IV – 2004
	The Official Gazette on-line	Active service (available)	Q. IV – 2004
11.	Portals of integrated	Feasibility Study	Q. III –

No.	Project Title	Purpose	Term
	services for citizens	Specification of the tender demands and procedures	2004 Q. II – 2005
12.		Development of the initial services Costs for the following year	Q. II – 2004
13.	Implementation of initial services	Feasibility study Establishment of services	Q. I – 2004 Q. IV – 2004
14.	Portals of services for certificate issuance	Phase 1: interactive access Phase 2 : automatic access	Q. IV – 2004 Q. III – 2005
15.	Portal of on-line posting of vacancies	The National Service for identifying cavancies	Q. IV – 2004
16.	The portal offering services for businesses		Q. IV – 2004
17.	Interoperability among county networks	Feasibility study The national information technology network	Q. II - 2004 Q. II – 2005
18.	Subsidiary services and services for ensuring decentralisation	Services for primary support	Q. IV – 2004 Q. II – 2005
19.	Promoting IT among the institutions of the local administration	The computerisation of for civil status registries The computerisation of the on-line services to citizens	Q. II – 2004 Q. IV – 2005 Q. IV – 2006
20.	Access to the certification service of civil status records		Q. II – 2004 Q. I – 2005
21.	The index of civil status records	Index development and management	Q. IV – 2004
22.	The index of civil status records	The national service for event notification	2002 - 2006
23.	Electronic identification cards (ID cards)	The issuance of 20,000 cards	Q. II 2004
24.	The issuance of electronic identity cards and providing integrated information services	The issuance of 1,000,000 cards	Q. II – 2006
25.	Promotion of the	Digital signature for public employees	2001 – 2004

No.	Project Title	Purpose	Term
	digital signature	Promotion for portal usage	
26.	The computerized management of documents	Recording systems The integration of Pilot Project systems	2004 – 2005
27.	Electronic acquisitions	The introduction and generalization of the electronic system of public acquisitions	2002 – 2005
28.	Training activities	Training system	Ongoing

The measures described by strategies as the ones included in GD 1007/2001 and GD 1440/2002, are in line with the demands of European Union (*eEurope* initiative), still, over the years, some of the timeframes proposed have proven to be hard to comply with, mainly due to the lack of financial resources allocated for this purpose, especially in the case of local public administration authorities which have also been confronted with difficulties in correlating and interconnecting the local and central data bases, which are a pre-requisite for reducing bureaucracy and enhancing the quality of services rendered by the Romanian public administration.

In order to generate an estimate of the financing needs and sources (central budget, local budgets, grants, credits, the private sector etc.), one year after the adoption of GD 1440/2002, in November 2003, MCTI brought amendments and additions to this document by issuing the "Development strategy for the electronic public services", accompanied by an action plan that presents and quantifies the financial effort necessary for its implementation, although there is still no detailed presentation of the potential financing sources.

This document, which is currently (December 2003) in the stage of draft, focuses on the main role of implementing the *e-Government* concept as a driving force for the acceleration of the IS implementation process in Romania. Thus, the abovementioned completes the already adopted strategies and, additionally, it proposes that on-line public services be provided as a combination of the following elements:

- Encouraging of competition on the ICT market;
- Reform and modernization of the central and local administration by applying the *e-business* principles*;*
- Electronic public aprocurement via Internet;
- Attracting investments for the development of *e-Government* and promoting public-private partnerships.

At the same time, the strategy proposes the following actual measures:

1. Continue reform at front-office level – extending of National Electronic System;
2. Extending the Public Procurement Acquisition System;
3. Network securization, ICT antifraud and promotion of intelligent cards;
4. Building the architecture for providing electronic public procurement services (*e-Government* architecture);
5. Implementation of global and local development policies;
6. Stimulating the intensive use of ICT in SMEs;
7. Infrastructure modernization and development;
8. Measures for including all members of the IS (*e-inclusion);*

- Introducing the universal service;

- Additional services for stimulating Internet access:
  Public Internet Access Points (PIAPs);
  Stimulating the acquisition of ICT equipment;
  ICT infrastructure in less developed areas.

The costs entailed by the implementation of e-administration are estimated by the aforementioned strategy to approximately EUR 340 million. At the same time, the strategy names, in general terms, some of the potential financing sources (state budget and other financial sources)

Within the context of promoting the IS and reforming the public administration, in 2003, Law no. 161/19 April 2003, Title II, "The transparency of administration of public information and services provided by electronic means" was adopted. This legal act includes the most important objectives of the previously adopted strategies, especially the ones referring to e-government and e-administration, and integrates them into a unitary system called the National Electronic System (NES). Moreover, Law 161/2003 sets a number of measures and strict deadlines regarding the on-line presence of the local public administration and the availability of basic services supplied by the latter over the Internet, both to citizens and to companies. A more detailed description of the provisions of Law 161/2003 were included in Chapter 8 of the present Report.

Conclusions

The implementation of the IS in Romania has been a constant concern of the Romanian government, institutions that has displayed full availability towards the initiatives that may lead to the acceleration of this process. There are economical factors which represent objective constraints that can slow down the development of the IS, especially at household level due to the low level of income per capita and the lack of awareness at this level. At the same time, an assessment of the current situation in EU Member States shows that SMEs in such countries are also confronted with difficulties in regarding the incorporation of ICT in their everyday business activity. However, it is expected that the intensification of the process of implementing electronic technologies and especially the NES and the generalization of the public procurement electronic system will lead to a substantial increase in the number of SMEs using ICT on a regular basis and to the increase in connectivity among this type of companies.

The economic growth recorded during the past 4 years, as well as the optimistic medium term forecasts of most international financial institutions represent a favourable background for continuing the IS implementation process, as stipulated in the Action Plans adopted by the government for this purpose. Although in the past there have been delays, and there may also be delays in the future, this situation is normal and also occurs at European level since, beyond the financial requirements of the process, there is need for a profound changes in mentality and working methods. Judging by the pace of implementing the IS during the past 4 years, Romania is very likely to catch up with EU countries faster than in other fields.

Chapter 4. Romania – Macroeconomics

4.1 Overview

In February 2000, Romania and the European Commission started the negotiations regarding the integration of the country in the European Union. Although negotiations started very slowly, they were accelerated during 2001 and 2003, so that at the end of 2003 all the chapters regarding the *acquis communautaire* (31) were opened and the negotiations were provisionally closed for 22 of those chapters.

During the period 2000 - 2003, the resuming of economic growth, the increase in exports, industrial output, efficiency of labour, investments, accompanied by a substantial decrease of inflation, placed Romania on the trend of a long-term sustainable economic development and built confidence for the fulfilment of the economic criteria for joining the European Union.

4.2 The Evolution of the Main Macroeconomic Indicators

The main economic indicators during the period of 2000-2003 are presented in the following table:

Table 3. The evolution of the main economic indicators

Indicator	Unit	2000	2001	2002	2003*
GDP – nominal terms	bil. USD	36.9	39.7	45.7	55.9
GDP growth – real terms (as compared to 1989)	%	+1.8	+5.3	+4.9	+4.5
Industrial output growth	%	+7.1	+8.2	+6.0	+4**
Domestic demand	%	+4.1	+8.1	+4.3	+6.4**
Inflation rate (December / December)	%	40.7	30.3	17.8	14
Unemployment rate – end of period	%	10.5	8.6	8.1	8.3
General consolidated budget balance	% of GDP	-3.9	-2.8	-2.5	-2.8
Exports of goods and services	Mil. USD	10,367	11,385	13,877	12,837**
Growth of goods and services exports	%	+23.4	+11.1	+16.9	+25.8
Imports of goods and services	Mil. USD	13,055	15,552	17,865	15,513**
Growth of goods and services imports	%	+27.1	+17.2	+12.1	+43.2
Current account balance	% of GDP	-3.7	-5.9	-5.4	-4.8
Public debt, of which:	% of GDP	31.3%	28.8%	28.3%	27.3%
- internal	% of GDP	9.2%	8%	7.1%	5.6%
- external	% of GDP	22.1%	20.8%	21.2%	21.7%
Foreign investments	bil. USD	0.8	1.4	1.1	1.2
Average ROL/USD exchange rate	ROL/USD	21,693	29,061	33,055	33,250

Indicator	Unit	2000	2001	2002	2003*
Average ROL/EUR exchange rate	ROL/EUR	19,956	26,027	31,255	37,331

Source: INS, PFM, Eurostat; NBR

* forecast;

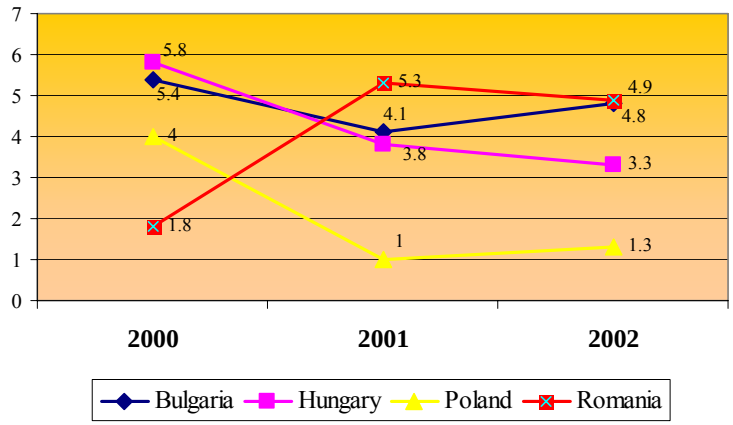
** actual values for the first 9 months of 2003;

4.2.1 The evolution of GDP in Romania and other CEE countries

The evolution of the Romanian economy following 1990 was marked by the succession of growth or stability periods with severe recession periods. The economic imbalances in the Romanian economy became severe at the beginning of 1997, when inflation rose to a record of 151% and the economy entered into a steep recession, amplified by the deterioration of international macro economical climate. Only in 1999, a series of monetary and fiscal measures succeeded in stopping the decline of the significant economic growth indicators, 2000 being the first year of economic growth since 1997, marked by a GDP increase of 1.8%, followed in 2001 by a positive change of 5.3%, in 2002 by 4.9% and a 9 month growth in 2003 of 4.5%, less than the forecast made at the beginning of the year, mainly due to the lengthy draught which affected the agriculture production. These growth rates place Romania on lead position among the candidate countries from the GDP growth rate point of view.

The following chart presents the evolution of GDP growth over the last 3 years in 4 of the 10 countries wanting to join CEE, stressing a significant superior trajectory in Romania's case for the end of the period. This trend is expected to be maintained in the following period, offering foundation for reducing the lag between the development of the Romanian economy and the average of the applicants for EU integration.

Graph 1. Comparative Analysis of the GDP Growth Rate (%) in Romania, Bulgaria, Hungary and Poland during 2000 – 2002



Source: www.securities.com

The resuming of economic growth in Romania starting with 2000 was determined mainly by the significant growth of domestic consumption due to the explosion of credit and leasing, as well as by the slight increase in average salary revenues, as shown in the following table:

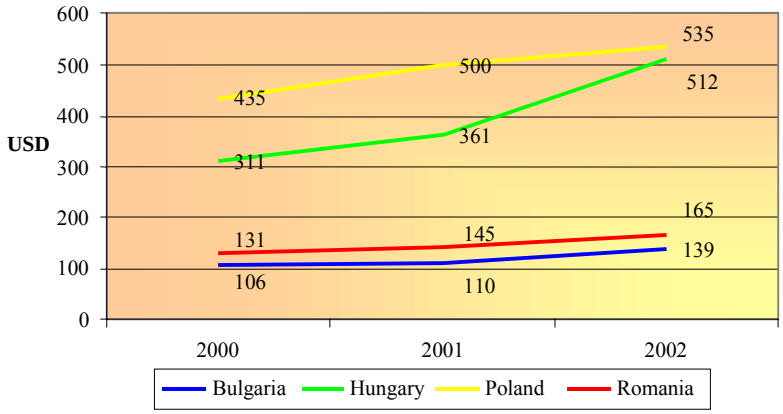
Table 4. Evolution of Monthly Gross Average Salaries

Indicator	1998	1999	2000	2001	2002	2003*
Monthly gross average salary (USD)	149	128	131	145	165	201

*Source: Primary data supplied by INS (*average for the first 8 months of the year 2003)*

Industrial output also registered an expansion, but the component of fast moving consuming goods and hardware is, and will continue to be on the medium term, strongly dominated by imports. For the medium term the purchase power of Romanians is expected to double. This will lead to an increase in disposable income, available for purchases of computers and communication services. For comparative purposes, we present in the following table the average gross salaries in 4 countries from CEE, including Romanian, during the period 2000 - 2002.

Graph 2. Evolution of the Average Gross Salary in Romania, Bulgaria, Hungary and Poland during 2000 - 2002



Source: SNI

The comparative analysis of this indicator shows that, although the salary revenues follow an obvious growth trend, its level is still low, comparing to the majority of the candidate countries values, determining corresponding dissimilarities in the distribution of the households' expenses, both globally and specifically, for communications, as shown in the table below.

Table 5. Comparative analysis of the communication expenses/household in 2002

Country	Population[1]	Number of households[2]	Monthly expenses per household (EUR)[3]	Average monthly gross salary (EUR/pers)[4]	Communication expenses (EUR)[5]	% of the total expenses per household[6]
Bulgaria	7,845,499	3,066,231	136.49	139.1	7.51	5.5%
The Czech Republic	10,204,000	3,827,678	579.68	514.6	23.19	4.0%
Poland	38,600,000	13,878,000	450.85	553.2	20.29	4.5%
Hungary	10,152,000	3,819,900	455.10	511.7	26.40	5.8%
Romania	21,698,181	7,392,131	121.04	174.4	6.29	5.2%
Slovakia	5,379,161	1,665,536	489.60	316.4	17.63	3.6%

Source: [1,2] – IBM, „3rd Report on Monitoring of EU Candidate Countries (Telecommunication Services Sector)"

[6] – INS, „CANSTAT Statistical Bulletin no. 2/2003"

According to INS, the communications expenses are comprised from: fixed and mobile telephony invoices, postal services expenses and repairs of the audio-video and communications equipments.

As presented in the above table, an income increase up to the level obtained in some candidate countries, such as Hungary or Poland, could lead to the increase of the absolute value of the expenses for ICT products and services, considering that in Romania the share of these expenses in the total expenses of one household is comparable with the one achieved in other candidate countries. Assuming that the Romanian households will maintain the same share for the communications expenses (although it might also grow), an increase of the average salary revenues would lead to the increase of the consumption demand in the ICT field.

4.2.2 The Evolution of Foreign Trade

Over the last 4 years, the Romanian foreign trade experienced an unprecedented dynamics through the exports increase. The encouragement of exports was achieved mainly through measures undertaken by the authorities for this purpose (the introduction of a reduced tax quota for the profits obtained from exports, starting with 2000, with the gradual increase up to the normal quota in 2004, the partial subsidizing of interest for some of the export loans, the granting of exports collaterals for complex products, with long manufacturing cycle), which led to the reviving of the industrial activity and the increase of the share of the highly processed industrial products in the total exports.

The EU countries were the main destination of the Romanian exports, holding a share of approximate 67% in 2002, comparative to 64% in 2000. Thus, it is noticed that 3 EU members hold almost one half of the total exports (Italy 25%, Germany 15,6% and France 7,6%).

The imports growth had multiple causes, related both to the evolutions in the national economy and to the external conjuncture. The main cause was the increased demand for equipments and consumer goods, accompanied by the explosion and gradual reduction in prices of the consumption credits and leasing systems, oriented to imports and with negative

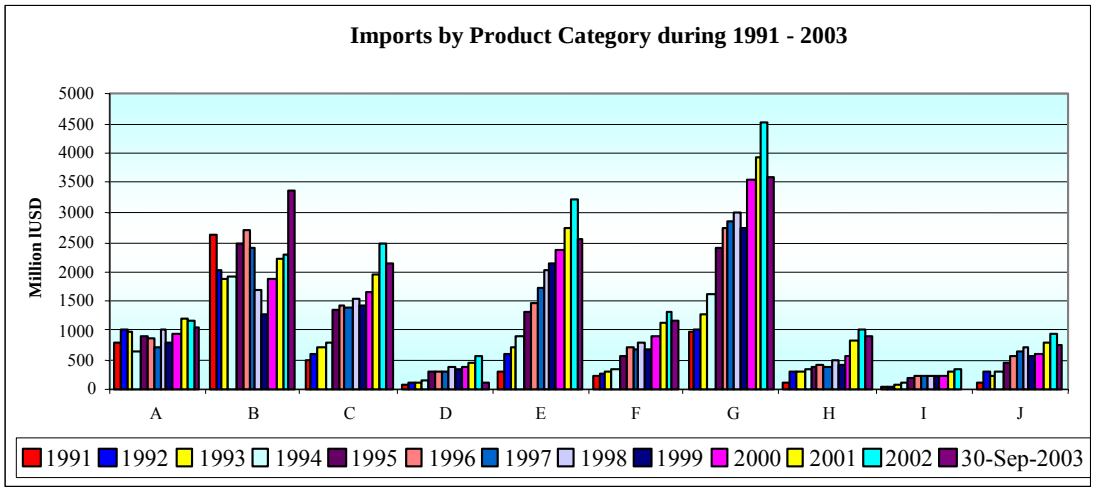
influences on the internal output, which is obsolete as far as the variety and the quality of the manufactured goods is concerned.

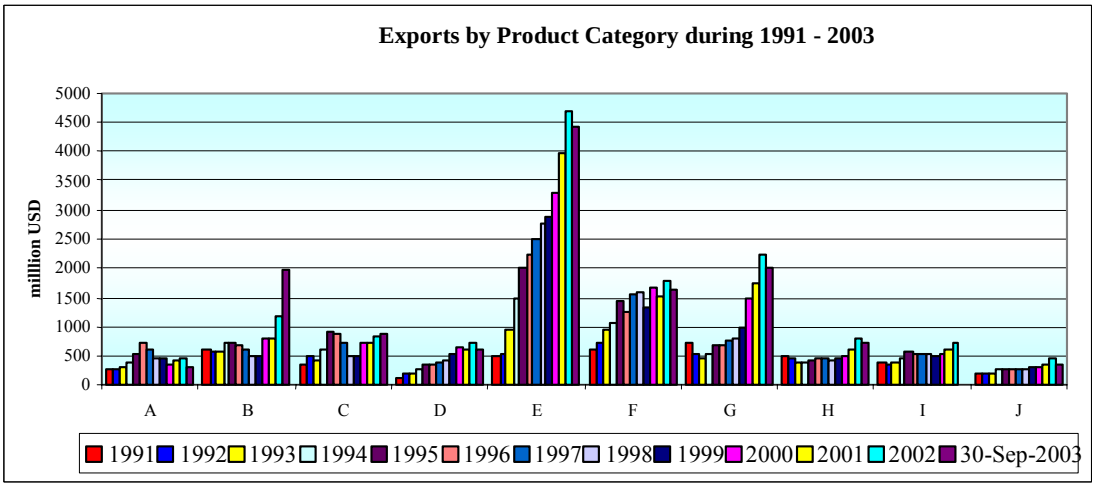
With respect to the ICT sector, the import of such products is exempted from custom duties, regardless of the origin country. At present, this sector is not the subject of any special facility regarding the stimulation of foreign trade and benefits from the same tax policy as the other sectors.

In 2002, four groups of products composed 80% of the total exports, respectively light industry products (35%), machinery industry (22%), metallurgic industry (13%) and wood industry products (10%). The structure reproduced in the first 9 month of 2003, demonstrating that the structural adjustment of the Romanian economy is not yet complete. The specialized associations claim the value of software exports amounts to approximately 200 million Euro.

The analysis of the foreign trade evolution during 1991 and 2002, regarding different categories of products can be resumed as follows:

Graph 3. The Evolution of Foreign Trade between 1991 - Sept. 2003





Source: INS

The breakdown of the products categories, according to the Combined Nomenclature, used by the National Institute of Statistics, is as follows:

A – Live animals and animal products; vegetable products; animal or vegetable fats and oils; prepared foodstuffs, beverages and tobacco;

B – Mineral products;

C – Chemical products, plastics, rubber and articles thereof;

D – Wood products, excluding furniture; pulp of wood, paper, cardboard and articles thereof;

E – Textiles and textile articles; footwear, headgear, umbrellas and similar articles;

F – Base metals and articles of base metals;

G – Machinery and appliances; electrical equipment; sound and image recorders and players; optical, photo, cinema, measurement and instruments and medical-surgical instruments and watches, medical instruments;

H –Vehicles and associated transport equipment;

I – Miscellaneous manufactured articles;

J – Raw hides and skins, leather, fur skins and articles thereof; articles of stone, plaster, cement, ceramic, glass and similar materials; products not elsewhere classified in C.N.

That this sector has not yet achieved its full potential, considering that the balance of trade ICT of products inclines to imports. Thus, although it is expected a slight improvement of ICT exports in the next period, the deficit for this category of products will maintain, considering that, on the short and medium term, Romania depends on the technology imports, especially in communications sector.

4.2.3 Foreign Direct Investments (FDI)

The foreign direct investments in Romania in the last 13 years (1991 – 2003) had a sinuous evolution, influenced both by internal factors (the regulatory and institutional framework, the content of the privatisation offer) and by external factors (evolutions on the financial markets, regional conflicts, the evolution of the economic cycle in the main developed countries).

According to the statistics by the National Office of the Trade Registry, the total volume of foreign investments in Romania at 31 December 2002 amounted to 8.94 billion USD, respectively 8.57 billion EURO. This value represented the contribution to the registered capital of the 89,900 companies set up with the participation of foreign capital.

Table 6. The Progress of Foreign Direct Investments in Romania: 1991 – 2003

Year	The value of the subscribed registered capital in currency equivalent		Companies with foreign capital participation	
	'000 USD	%	No.	%
1991	533,527	5.29	5,526	5.82
1992	342,753	3.40	10,827	11.40
1993	361,301	3.59	9,858	10.38
1994	859,497	8.53	10,717	11.29

Year	The value of the subscribed registered capital in currency equivalent		Companies with foreign capital participation	
	'000 USD	%	No.	%
1995	219,259	2.18	4,249	4.47
1996	499,191	4.95	4,449	4.69
1997	357,828	3.55	5,864	6.18
1998	701,921	6.97	8,978	9.45
1999	1,073,454	10.65	7,736	8.15
2000	1,371,195	13.61	7,078	7.45
2001	1,522,038	15.11	7,142	7.52
2002	1,097,121	10.89	7,487	7.88
The first 9 month of 2003	1,137,000	11.28	5,050	5.32
TOTAL	10,076,085	100.00	89,911	100.00

Source: The Ministry of Economy and Trade

**Source: The Romanian Agency for Investments (ARIS)*

For 2004, an increase of the foreign direct investments is expected, considering the privatisation of the national companies of distribution of energy and gas and the privatisation of the national company of oil and gas, Petrom. After 14 years of transition, Romania has not yet benefited from its potential for green-field investments, especially for hardware production.

Concerning the FDI in the ICT field, foreign investments are predominant mainly because of the lack of performance of this industry at the beginning of the 90's, as a result of the drastic reduction in the funds allocated for investments in this sectos during the '80s. In practice, the local electronics industry, and in particular the fast moving consumer goods industry ceased to exist for a period because the existing technologies, dating from the '70's, were not able to manufacture competitive products for Romanian consumers or for the foreign markets.

Starting with the second half of the 90's, due to foreign investments, but also to the privatisation of some specialized companies, the first local producers of electronic and white products have appeared. The investment of around 100 million USD made by Solectron in Timisoara, concerning a company specialized in the assembly of mobile phones and hardware equipment, is noteworthy. At the same time, the privatisation of Artic led to the appearance of a new range of Romanian home appliances, and Electrolux invested in a factory for domestic cookers field.

The highest improvement was achieved in the field of communications and Internet-related services, dominated so far by the foreign investments. Thus, together with the granting of the first licence for mobile telephony, in the first half of the 90's, the first major foreign investment in this field appeared, followed by the granting of the 2 licences operated at present by Orange and TIW Canada.

The process of attracting FDI continued through the privatisation of the national operator of fixed telephony Romtelecom, purchased by OTE Greece and other new foreign investments in the mobile telephony field, using state-of-the-art technologies.

Concerning cable operators, initially, there were local investments. The unprecedented development of this market generated the need for supplemental capital, so that at present the dominating companies on this market have foreign investments funds or major European operators as shareholders. For instance, the CaTV , Internet, data and recently telephony operator, Astral, attracted a 20 million USD investment in 2000 from AIG New Europe Fund, a part of the AIG Capital Partners, one of the investment division of the American International Group (AIG). Also, it is estimated that United pan-Europe Communications – UPC invested in Romania, until the end of 2002, over 60 million USD for the purchasing and development of some local cable communications networks.

It is estimated that, as 2007 – the expected yearfor Romania's accession to the EU - approaches, the attraction for investments on this market will grow and during the next 3 or 4 years of the FDI growth rate will increase, especially by stimulating a growing interest in the field of ICT on the part of investments funds.

4.2.4 ICT sector development

The last stage of the telecommunications market liberalization took place in 2003, when, starting January 1st, the fixed line telephony monopoly ended. The liberalization process started in 1991 and has covered the following markets:

- Terminal equipment (liberalization in 1991; the devices have to gain a type authorisation);
- Data transmission (liberalization in 1992; local loop belongs mainly to the incumbent operator);
- Mobile radio-communication (liberalization in 1992; licensing are awarded based on the available radio spectrum);
- Satellite communication services (partially liberalized in 1992 for VSAT equipment and various types of services and later on extended in 1996);
- Broadcast of radio and TV programmes; (liberalized in 1992; the National Radiocommunication Company provides services of transport of national radio and TV programs produced by the Romanian Radio and Television Broadcasting Company an the Romanian Television Company);
-

These efforts, concentrated to the provision of communication services at affordable prices for everybody have led to the following configuration of the Romanian telecom market:

Fixed Line Telephony

Romtelecom, the national operator, has obtained an operating license in 1998 for a period of 15 years, which included the exclusive operation rights for fixed line voice telephony and leased lines until December 31st, 2002. On January 1st, 2003, the telecom networks and services market was completely liberalized. However, Romtelecom is facing heavy competition mainly in the international call segment, as in the local and regional fixed telephony segment, until December 2003 The only domestic competition is represented by Atlas Telecom that offers fixed telephony services using DECT technology (low mobility telephony services) and Astral Telecom, a national supplier of integrated communication solutions, that launched, in December 2003 the Astral Telefix fixed telephony service.

Nevertheless, it is expected that, within a short period, the number of the local fixed telephony suppliers will increase significantly, considering that ANRC granted, after the 1st of January 2003, over 40 licences for using the numbering resources. The stated objective of the authorities is increasing the degree of fixed telephony penetration considering that the average rate of 21% of the population recorded until December 2003 is quite low compared to the 36% rate in CEE countries.

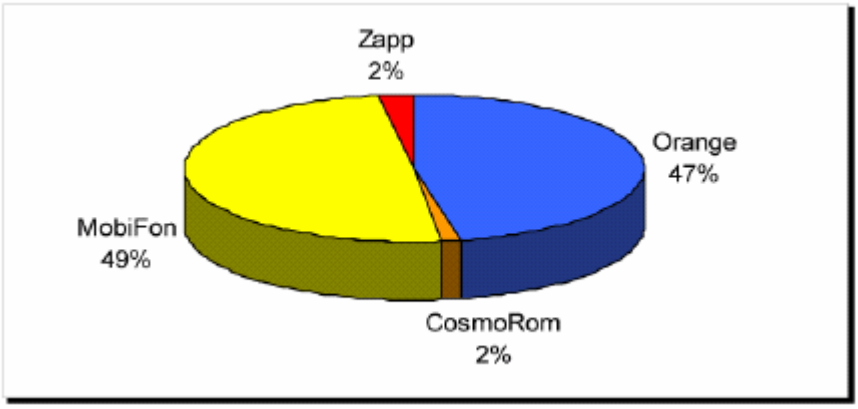
Mobile telephony

The monopoly on this market was held until 1997 by Telemobil (initially known as Telefonica România), which launched in 1993 NMT-450 services. Since 1996, two operators were granted GSM licences in the 900 MHz frequency and the major commercial success their services achieved in 1997 temporarily eliminated Telemobil from this market. The two companies are MobiFon, owned by ClearWave N.V., Vodafone and local investors, and MobilRom (that subsequently changed its name to Orange Romania), owned by Orange, the major shareholder, and local and international investors. Currently (December 2003), the two companies operate under the Connex and, respectively, Orange trade marks.

The Romtelecom's branch, Cosmorom, has held the GSM operation licence in the 1800 MHz frequency since 1998, but at present (December 2003) the possibility of selling this operator by its main investor - OTE -is being discussed due to the financial difficulties Cosmoron has been facing

On 7 December 2001, Telemobil launched in Romania a digital mobile telecommunication network in the 450 MHz frequency, based on the CDMA 2000 technology, under Zapp trade mark, and the first European integrated mobile communications service (voice and high speed transmissions) based on this technology.

Graph 4. The market share of the mobile telephony operators in Romania*



Source: European Mobile Communications Report, Nr.176, October 2003

* June 2003

Internet

ISPs are currently in a consolidation process. The national providers are private companies, the most important of which, in December 2003, being: Equant Romania (previously named Global One Communications România) Romania Data Systems (RDS), FX, Internet, TCM, PC Net, Kappa, Xnet, Euroweb, Astral Telecom, EasyNet etc., . It is estimated that the liberalization of the fixed telephony market, the increase in mobile communication and cable networks will all contribute to the increase in the use of the Internet on the short and medium term.

Cable television

This market is in full consolidation, concentration and diversification of services process. The network operators gradually changing their offer to the provision of data transport and internet services. The main 6 cable TV companies accounted for over 75% of the market in December 2003, the most important such operators being: Astral Telecom Romania, Romanian Cable Systems (RCS), , UPC and FX.

The cable operators are currently upgrading their networks, using fibre optics, in order to be able to provide integrated communication services: TV broadcasts, data and voice transmission. These services are detailed in the "Access" section (Chapter 7) of this report.

Other services

The National Radiocommunication Company (SNR) operates a 2,500 km digital radio network, used for the broadcast of the public national radio and TV programmes, for internet services and data transmission. Until December 31st 2002, SNR was the sole provider of leased radio transmission for capacities over 2 Mbps.

SNR also operates a satellite communication centre and is part in the operational agreements for Eutelsat, IMSO and ITSO. In 1999, the company has completed the digitisation process, and is therefore able to provide higer quality satellite communication (TV, phone, VSAT services). In June 1999, SNR has launched the largest national SDH network, with a capacity of 622 Mbps, with links in the 4, 6, 7 and 11 GHz frequencies, one of the most advanced networks in CEE in length and capacity.

During 2001 - 2002 SNR has extended the services offered, becoming from a carrier an end-to-end services provider. The company has obtained a licence for data services for end-users and a licence to install and operate a national digital point-multipoint radiocommunication network in the 24.5 – 26.5 GHz frequency bands. Using this network, SNR intends to build a national network by means of which it will have direct access to consumers. The network will allow a direct digital connection with a band width between 64 Kbps and 34 Kbps. The types of services that can be offered after implementing the radio access network for the local loop are: leased lines/broadband access and voice services, Internet, video services, VPNs, added value services.

ICT sector[1]

After the severe reduction suffered after 1989, the hardware industry in Romania managed to restructure through the presence in the market of new producers which are currently dealing mainly with the assembly of equipment imported from Asia. Foreign companies have an active presence, with approximately 50% of the market share.

The software industry had a remarkable development. There are over 4800 companies which state software development as main activity.

There are over 8.100 ICT companies with over 86.000 employees. Mainly due to the favourable tax system for very small companies (profits tax of 25% is replaced with an income tax of 1.5%) their number has increased representing 92% of the total number of companies in the sector. However their contribution is less than 10% of the sector turnover.

The sector has an important contribution to the national economy as its contribution to the turnover of all businesses exceeds 4% and 7.6% to their profit, despite the fact that ICT companies represent only 2% of the total number of active companies.

Table 7. ICT sector analysis*

Total ICT		Very small	Small	Medium	Large	Total	% of total businesses
No. of companies		7,455	550	88	24	**8,117**	**1.96%**
No. of employees		9,030	11,156	8,453	57,473	**86,112**	**2.32%**
Turnover	Mil. Euro	286	406	311	2,367	**3,370**	**4.02%**
Net profit	Mil. Euro	63	40	28	205	**335**	**7.68%**

Table 8 and chart 5 below illustrate that the hardware production has a limited contribution to the sector performance. This can be explained by the low appeal of the Romanian business environment, especially during the period when such investment took place in other CEE countries (1994 – 1998), but also by the important investment needed to start such an activity, beyond the possibilities of local investors. Such investments are intended for significantly larger markets (in terms of units sold) than Romania, which requires the existence of export markets. A success story in this branch is the investment of around USD 100 million of the US company Solectron, which, even if it deals only with the assembly of equipment (mobile phones and IT hardware) has over 2,500 employees, and exports the entire production to the European branches of the holding company. The main local investments in assembly of PC's are Flamingo, Ktech, Best Computers.

Software has a more significant weight within the sector and is mostly represented by a large number of very small business, due mainly to the tax advantages. The law in force at the end of 2003 allows tax exemptions only to the IT specialist employees that are graduates of at least one of the four specialized universities (electronics and telecommunication, automatic

[1] The tables and graphs in this section refer to the companies registered with the following CAEN codes:
- Cod CAEN 30 - 'The electrical and optic equipment industry';
- Cod CAEN 64 - 'Postal services and telecomunication';
- Cod CAEN 72 - 'Information and ancillary activities'.

* as of December 2002

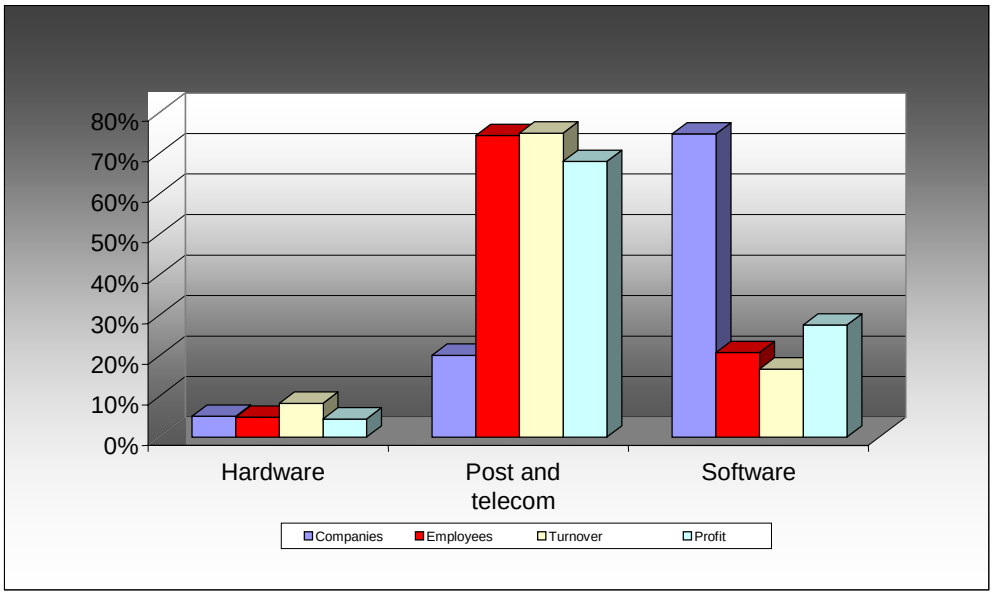
and computers, informatic mathematics, cybernetics) and not to allpeople active in the field that have attended specialized postgraduate courses .

The turnover of companies in the communications branch is larger, showing that the sector is in full growth, even if the consumption of individuals and businesses are still reduced. The significant investments needed were performed by large international companies who have built the necessary infrastructure and have employed a considerably larger number of people that the other two branches of ICT.

Table 8. ICT sector analysis, sub-branch information*

Post and Telecom		Very small	Small	Medium	Large	Total
No. of companies		1,424	160	31	19	**1,634**
No. of employees		2,163	3,452	3,176	55,235	**64,026**
Turnover	Million Euro	83	114	76	2,253	**2,526**
Net profit	Million Euro	15	8	8	196	**228**
Equipments	UM	Very small	Small	Medium	Large	Total
No. of companies		348	51	11	3	**413**
No. of employees		418	993	1,272	1,506	**4,189**
Turnover	Million Euro	31	90	61	98	**280**
Net profit	Million Euro	3	4	1	7	**15**
Software	UM	Very small	Small	Medium	Large	Total
No. of companies		5,683	339	46	2	**6,070**
No. of employees		6,449	6,711	4,005	732	**17,897**
Turnover	Million Euro	173	202	173	16	**564**
Net profit	Million Euro	44	28	19	2	**92**

Graph 5. ICT sector analysis, sub-branch information *



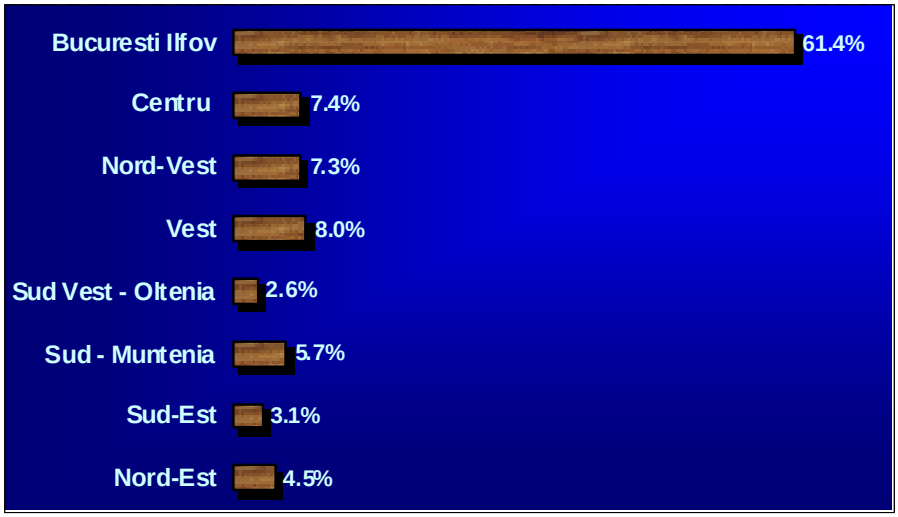
* December 2002

The regional distribution of the companies active in the ICT sector shows that, in terms of turnover, Bucharest owns the highest share in the country. This can be explained by the fact that the headquarters of the main companies, and especially those in the communications business are located in the capital. The following graph is suggestive of this state of facts:

Graph 6. Regional Distribution of the Turnover in ICT*

If this regional distribution does not represent an impediment in the development of the Information Society at local level in the case of the hardware and communication industries, the same concentration in the software branch could indicate that necessary human resources will not be available at local level. The next chart presents the regional distribution of the turnover in the software industry, which indicates, ultimately, the concentration of the workforce.

Graph 7. Regional Distribution of the Turnover of Software Companies*



* according to 2002 Balance Sheet information
* according to 2002 Balance Sheet data

4.2.5 Research Activities in the Field of Information Technology and Communications

In Romania, public financing sources are still limited, , as can be observed from the following table:

Table 9. Comparative Values of the Weight of R&D Expenses in GDP

	Romania	Bulgaria	Poland	The Czech Republic	Greece	Irleland
Population in 2002 (million)	21.8	7.2	38.6	10.2	10.6	3.9
Research expenses (% of GDP)	0.4%	0.6%	0.7%	1.4%	0.7%	1.2%

Source: The World Bank – ICT at a glance 2003

Starting 2001, the National Institute for Research – Development in Informatics, in a consortium with the University of Bucharest, the Academy of Economic Studies (ASE) – Bucharest and the Center for Training in Informatics – SC CPI SA Bucharest, coordinates the National R&D and Innovation Program "INFOSOC – the Information Society", a component of the National R&D and Innovation Plan for the period 2001 – 2005. The program represents the framework within which the research units and the businesses in the Romanian ITC industry may carry out large-size projects designed to support the IS in Romania.

The program is meant to be correlated with the Romanian National Economic Development Strategy on Medium Term and with the National Strategy for Introducing the IS, on the one hand, and with the recent EU documents regarding the eEurope+ program.

Within this context, the program is set to achieve the following overall objectives:

- Achieving and consolidating the conditions necessary for developing the IS in Romania:
- Developing the scientific and technological support necessary to achieve the structures and services specific for the IS;
- Increasing the degree of utilization and the impact of structures and services specific to the IS upon the sectors of the economy, as well as upon the society in general, even at citizen level.

The main results estimated to be obtained by the InfoSoc program are represented by:

- High quality instruments, information systems and services, based on multimedia technologies, on new/improved software methods and models;
- Network structures, services, systems, equipment, advanced communication models and technical prescriptions;
- Instruments, systems and applications based on high quality calculus;
- High speed national network for R&D and Technological Transfer.

The total budget planned for the INFOSOC Program by 2005 is of ROL 350 billion, of which, for the period 2001 – 2003, projects in the amount of ROL 214 billion have been contracted.

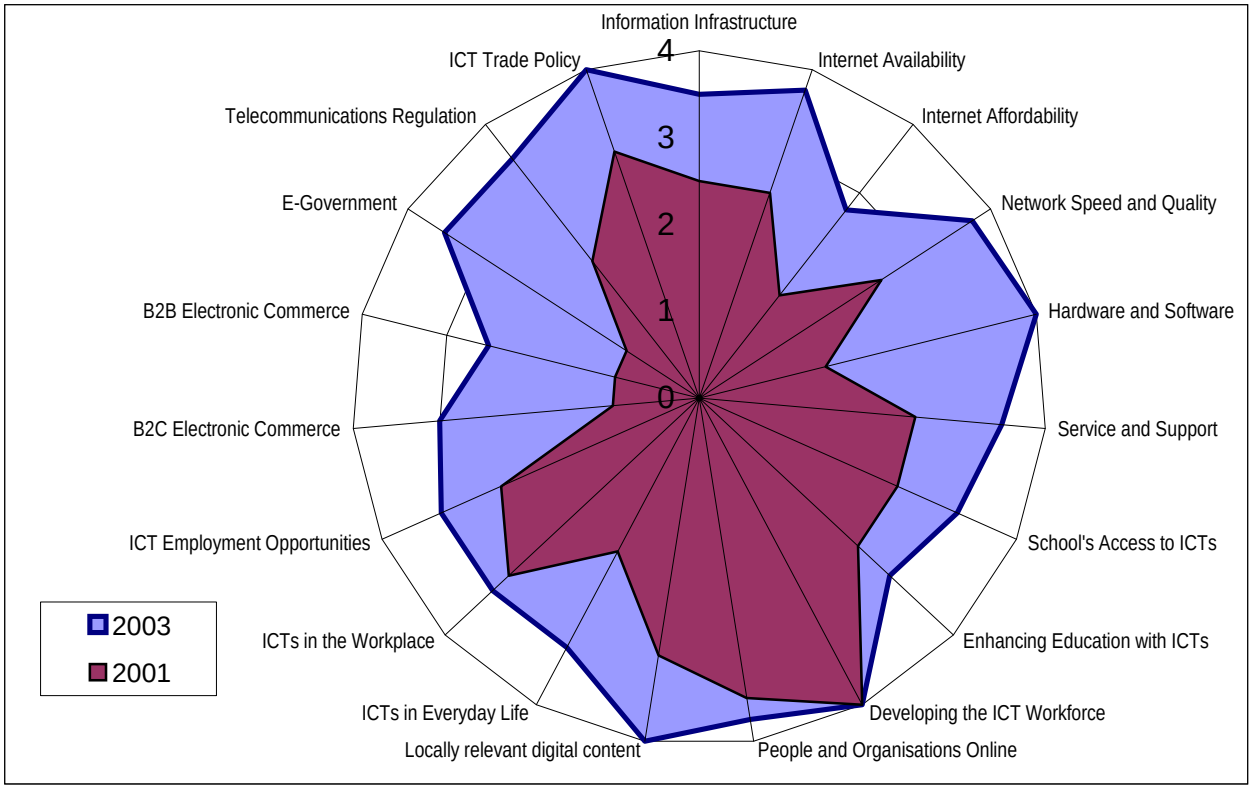
Chapter 5. Summary of the Assessment using the „Readiness for a Networked World"* Methodology

The table below summarizes the assessment of e-readiness in Romania, from perspective of the consultants that, along with the Work Group formed under the Ministry's supervision, evaluated the results obtained in the last two years (from the previous assessment). Concerning the progresses made in the IS implementation, the detailed results are presented in Chapters 6 – 11 of this report. The following comments refers only to the obstacles that prevented the achieving of the maximum grade. We mention that some scores also consider the expected short-term effects of the implementation of the legislation adopted during 2002 and 2003, evenhough at present the effects are not yet visible.

Categories	**2003**	**2001****
1. **Network Access – Chapter 7**		
Information infrastructure	**3,5**	2,5
Internet Availability	**3,75**	2,5
Internet Affordability	**2,75**	1,5
Network Speed and Quality	**3**	2,5
Hardware and Software	**3,5**	1,5
Service and Support	**3,5**	2,5
2. Networked Learning – Chapter 9		
School's access to ICTs	**3**	2,5
Enhancing Education with ICTs	**3**	2,5
Developing the ICT Workforce	**4**	4
3. Networked Society – Chapter 8 and 10		
People and Organizations Online	**3,5**	3.5
Locally Relevant Content	**4**	3
ICTs in everyday Life***	**3,25**	2

* Prepared by Harvard CID and presented in Annex 1
** 2001 score determined by UNCTAD/WTO International Trade Centre
*** This score refers mainly to urban regions

Categories	**2003**	**2001****
ICTs in the Workplace*	**3,25**	3
4. Networked Economy – Chapter 11		
ICT Employment Opportunities*	**3,25**	2,5
B2C Electronic Commerce	**3**	1
B2B Electronic Commerce	**2,5**	1
E-Government**	**3,5**	1
5. Network Policy – Chapter 6		
Telecommunications Regulation	**3,5**	2
ICT Trade Policy	**4**	3



The comparative analysis of the two valuations emphasizes the significant progress of Romania for most of the analysed categories.

The most notable progresses are those of the "Access" and "Society" sections, due to the major improvements in network availability and quality of the services, and to the progress in implementing e-government services, respectively.

* This score does not consider the jobs in agriculture

** This score reflects the existence of websites for the majority of government agencies and the fact that, for part of its procurements, the government employs the "e-procurement" electronic system

We detail below the reasons why the maximum mark could not be achieved in every section analysed.

1. Network Access

- Information Infrastructure

The 3.5 mark shows that a considerable part of the community has access to high quality telephony services. The boom of mobile telephony led to an unprecedented growth in the number of communication services users. However, the gap between the urban and the rural areas persists, as the range of communication services is not so complex in the latter areas. Approximately 96% of the Romanian population has mobile telephony coverage.

- Internet Availability

Both individuals and businesses have the opportunity to choose from a relatively large number of ISP's and technologies. The number of public Internet access points is still relatively low (we are not referring to Internet café's which are private businesses).

- Internet Affordability

Although the access costs are low in comparison with the EU or candidate countries average, the revenues of most of the population are not at a sufficient level as to allow intensive Internet use from home. This is also proven by the structure of the households expenses presented in the Macroeconomics section. However, the situation is expected to change over the next 3 years due to the intensive reforms accelerates as Romania progresses towards EU integration.

- Network Quality and Speed

The increase of the fixed telephony digitisation degree, the national extension of fibre optic network, the complete geographical coverage of mobile telephony and the availability of the latest technologies (aspects that are all detailed in the chapter referring to "Access" of the present report), have led to a significant increase in quality and voice and data transmission speed up to the European levels. There are still some deficiencies to deal with, such as the long waiting list and long waiting time, for the setting up of a fixed telephony line, as well as the high number of faults per 100 fixed lines (23).

- Hardware and Software

There are no limitations concerning the availability on the Romanian market of the hardware and software solutions. As the market is sufficiently extended, a significant number of equipments and programs are designed with Romanian language interfaces. There is still a problem regarding generalized access of the population to hardware and software products due to financial constratints. This problem will gradually be solved as the average income of the population records an increase.

- Service and Support

The quality of IS services is regulated, the maximum period for solving faults being set in accordance with international practices.

2. Networked Learning

- School's access to ICTs

As the process of acquiring hardware and connecting the universities to Internet has accelerated over the last 3 years, the statistics of the Ministry of Education show a relatively satisfactory level of computers penetration and Internet connections as compared to the financial resources of the public budget. IT laboratories, connected to the Internet, are now organized at high-school level. A similar process is also intended for the elementary school, but at a slower pace in the rural areas.However, no secondary and elementary school has two or more independent IT laboratories and broadband connectivity is not yet widespread.

- Enhancing education with ICTs

ICT became a compulsory subject for the secondary and tertiary education (high schools, vocational schools and universities). Computers and ICT's are not fully incorporated in the education process in a generalized way, at national level.

- Developing the ICT workforce

The tertiary level prepares a sufficient number of ICT specialists. There are numerous ICT training opportunities available on the market. Also, the civil servants benefit from free IT training. The only problem is the concentration of such specialists in major urban areas.

3. Networked Society

- People and organizations online

The last few years have experienced an accelerated increase of the number of web sites with local content. Practically, during 2001 – 2003, their number has doubled, but it has not reached the minimum level of the developed countries (20 sites/1000 inhabitants). The companies that offer electronic commerce do not currently employ traditional mass media as a means of advertising.

- Locally relevant content

The boom of the number of sites was accompanied by a significant increase in quality and relevance of the information presented. Public administrations, private businesses as well as non-governmental agencies web sites offer various information, in Romanian language, covering all the aspects of economic and social life.

- ICTs in everyday life

Despite the increase in the number of websites and their quality, the limited presence of real e-commerce solutions and of a PIAP network limits the use of ICT in everyday life. The

National Electronic System (the e-government portal) was launched in September 2003 and the effects of its employment will become visible only during 2004.

- ICTs in the workplace

Although the number of computers and the degree of Internet penetration among businesses have increased significantly, the computers are still not connected to networks within some businesses and generalized Internet access to all employees is not always available. Statistical information regarding the gains in productivity obtained through the extensive use of ICT is not yet available.

4. Networked Economy

- ICT Employment Opportunities

As Romania is still in the process of structural adjustment of the economy and completing the major state-owned companies restructuring, the contribution of industry and agriculture to GDP is still significant. Nevertheless, a significant number jobs require ICT skills and this number is increasing, since adjustments of the economic sectors' contributions to GDP can be noticed every year. It is noteworthy that civil servants, from both central and local administration, have recently started the process of obtaining the ECDL certificate (European Computer Driving Licence) that became compulsory. When assigning the grade, we have not taken into consideration the quality of the agriculture jobs and their weight in the employed population.

- B2C electronic commerce

Although the use of Internet as a marketing channel is quite frequent and has an accelerated dynamics, the classical communication means (telephone, fax, post) are still preponderant in customer care services, whereas Internet Banking, Home Banking and Mobile Banking are used to a considerably smaller extent. The online sales volume is not yet an important component of retail trade.

- B2B electronic commerce

The use of this type of commerce is still limited, but the government's online public procurements system should stimulate its development. The automated inter-bank payment system is about to finish and is expected to give a significant boost to this indicator. Once the computers and Internet penetration among businesses will increase in order to achieve a minimum critical mass necessary to raise the efficiency of the transactions, the results for this indicator (for which relevant statistics are not available) will become significant.

- e-Government

This area of the Information Society has achieved a remarkable progress. All governmental agencies have now their own website, certain specific transactions can be concluded online (e.g. local taxes payment, public procurement, international transport authorizations), but the

majority of the services are still rendered through classical means. The public procurements system, available since 2001, will expand at national level by mid 2004.

5. Network Policy

- Telecommunications regulation

All EU regulations were assumed. A secondary legislation for the implementation of the Universal Service does not exist, but ANRC is currently (December 2003) drafting this project. Although the full liberalization of the communications market took place at the beginning of 2003, a fierce competition in this field necessitates a certain period of time.

- ICT trade policy

The trade policy is harmonized with the present EU regulations.

Chapter 6. Policy

During 2000 – 2003, Romania has transposed the entire *acquis communautaire* in the telelecommunication and IT field. The following table contains the community law transposition schedule, as well as the implementation stage of the legislation in this field:

No.	European Legislation	National legislation	Secondary National Legislation	Current Situation
1.	*Decision 91/396/EEC* regarding the introduction of a unique European number for emergency calls.	**2001** Government Decision no. 617/2001 on the National Unified System for Emergency Calls **2002** Ordinance no. 18/2002 on the national system for emergency calls	**2003** GD no. 277/February 27, 2003 regarding the Unique national system for emergency calls	Ordinance no.18/2002 approved by Law 398-2002 regarding the functioning of the National Unified System for Emergency Calls. GD no. 227/2003 regarding the approval of terms for setting up, operating and maintaining at required level of the Unique national system for emergency calls, as well as for the setting up of a dedicatd activity within the Special Telecom Service, financed entirely from own revenues
2.	*Directive 97/67/EC* regarding the common rules for developing the internal market of postal services and improving service quality	**2002** Ordinance no. 31/2002 regarding postal services.	1. Drawing up the procedure for authorizing providers of postal services - **2002** 2. Designating the suppliers of universal service - **2002**	Decision no. 1351/2003 regarding the terms and the procedure of designating suppliers of the universal service in the field of postal services, published in the Official Gazette of Romania, Part I, no. 855 of 12 December 2003 ANRC Decision no. 118 of 19 March 2003 regarding the procedure of authorizing the suppliers of postal services. Draft decision that proposes the updating of Decision no. 139/2002 regarding the establishment of a procedure of solving conflicts falling under the competence of ANRC.
3.	*Directive 2002/19/EC* regarding access to, and interconnection of, electronic communication networks and associated facilities (*Access*	**2002** Ordinance no. 34/2002 regarding access to the electronic communication networks and to the	1. Establishing the markets within the electronic communications sector with characteristics that may justify the imposition of specific obligations and the elaboration of	1. The final report of the study for identification of the relevant specific wholesale markets in the electronic communication sector regarding access to the local loop, rented line services, access to the associated infrastructure was published on September 12, 2003.

No.	European Legislation	National legislation	Secondary National Legislation	Current Situation
	Directive).	associated facilities, as well as their interconnection	the procedure for market analysis – **2002** 2. Performance analysis of the market in order to establish whether the markets are effectively competitive and establishing the providers of electronic communications networks and services having SMP on the markets not effectively competitive – **2003** 3. Imposition of specific obligations on the operators having SMP – **2003** 4. Control of compliance with specific obligations – **permanently**	2. Law no. 527/2002 for the approval of GO no.34/2002 - 7 alternative fixed phone network operators and a mobile phone network operators have already concluded interconnection agreements based on the Interconnection Reference Offer published in February 2003 by SC "Romtelecom" – SA, based on Decision no.147/2002 regarding the principles and pre-requisites of the reference offer for interconnection with the public fixed phone network, issued by ANRC; - Decision no. 1382/2003 which approves the regulations regarding the "top-down" construction of the long-term incremental cost calculation model by SC Mobifon SA; - Decision no. 1379/2003 regarding the interconnection for leased lines – terminal segments with the public fixed telephony line. This decision proposes that S.C. – "Romtelecom" – S.A. be obliged to conclude interconnection agreements with other operators in order to supply leased line-terminal segment services in a transparent and non-discriminatory manner. - Decision no. 1332/2003 regarding the reporting of certain statistical data by the suppliers of electronic communication networks and services.

No.	European Legislation	National legislation	Secondary National Legislation	Current Situation
4.	Directive *2002/2/EC* on a common regulatory framework for electronic communications networks and services (*Framework Directive*)	**2002** GEO no. 79 of 13 June 2002 regarding the general framework of communications, approved, with amendments and additions, by Law no. 591/2002, normative act containing the main provisions referring to: a) The establishment of ANRC; b) Authorisation of electronic communications networks and services;	1. Start of ANRC activity - **2002;** 2. Draft of general authorizations – **2002;** 3. Expiry of exclusive rights – **2002**	1. Setting up of ANRC in the 3rd qt. 2002 2. Decision no.131/2002 regarding the general authorization regime for supply of digital networks and communication services - Decision no.140/2002 regarding the National Numbering Plan and no. 141/2002 regarding the numbering resource utilization licence application and issuance procedure; - Tender organized by DGTCI within MCTI for granting radio-electric frequency utilization licences for national point-multipoint communication networks; 3. The telecommunication market was liberalized starting January 1, 2003.

No.	European Legislation	National legislation	Secondary National Legislation	Current Situation
5.	*Directive 2002/20/EC* on the authorisation of electronic communications networks and services (**Authorisation Directive**)	c) Protection of competition in the markets for electronic communications services.		Decision of the president of ANRC no. 138/2002 regarding the minimum requirements for the suppliers of electronic telecommunication services for the public. Starting 17 November 2003 the general authorization regime was modified according to the provisions of the Law of universal service, by the entering into force of Decision of the president of ANRC no. 1333/2003 regarding the general authorization regime for the provision of electronic communication networks and services. The new normative act abrogates the Decision of the president of ANRC no. 131/2002 that previously regulated the legal aspects related to general authorization. ANRC published: - the second form of the Decision draft for approval of the rules and regulations regarding the separate accounting bookkeeping, in the internal cost accounting of S.C. "Romtelecom" – S.A. - Decision draft for approval of the rules and regulations regarding the "top-down" construction of the long-term incremental cost calculation model by S.C. "Romtelecom" – S.A.

No.	European Legislation	National legislation	Secondary National Legislation	Current Situation
6.	Directive of the European Commission regarding competition of the electronic communication service markets, that consolidates the provisions of: - Directive 94/46/EC that amends Directive 88/301/EEC and Directive 90/388/CEE specifically regarding satellite communication - Directive 95/51/CE that amends Directive 90/388/EEC regarding the abolishment of restrictions to the use of TV cable networks for liberalized telecommunication service supply - Directive 96/19/EC that amends Directive 90/388/CEE regarding the implementation of full competition on the telecommunication market - Directive 99/64/CE that amends Directive 90/388/CEE to ensure that telecommunication networks and Cable TV networks that have the same operator as proprietor are distinct juridical entities.			

No.	European Legislation	National legislation	Secondary National Legislation	Current Situation
7.	*Directive 2002/22/EC* on universal service and users' rights relating to electronic communication networks and services (Universal Service Directive).	**2003** Normative act on universal service and users' rights relating to electronic communications networks and services. Law no. 304 of July 4, 2003 for the universal service and the rights of network and communication service users	- Designation of the universal service providers – **2004** Definition of projects that will be financed from the Fund by performing a feasibility study relating to the underserved areas - **2003**	*The program of designating the universal service supplier is to be discussed with ANRC* The launching, by ANRC of the public consultation for a series of decisions related to the implementation of this directive: - Identification of retail markets in the sector of electronic communications - the objectives of the market studies that are to be conducted by ANRC for the identification of specific relevant retail markets in the field of electronic communications; - designation of S.C. "Romtelecom" – S.A. as an operator with significant power on the market of supplying total or shared unconditional access to the local loop consisting in a pair of stranded metallic wires supply, for the purpose of supplying large band electronic communication services and phone services for the public in fixed points; - designation of S.C. "Romtelecom" – S.A. as an operator with significant power on the market of rented line-terminal segment services supply; - consultation regarding a decision draft that brings additions to Decision no.139/2002 (O.G. nr.20/15.01.2003) regarding the establishment of the procedure of solving the litigations falling under the competence of ANRC).
8.	*Directive 2002/58/EC* regarding personal data processing and protection of personal privacy in the field of telecommunication			Law no. 677/2001 for the protection of persons with regard to personal data and free circulation of such data, published in the Official Gazette no. 790 of December 12, 2001. Law no. 676 of November 21st, 2001, on the Processing of Personal Data and the Protection of Privacy in the Telecommunications Sector

No.	European Legislation	National legislation	Secondary National Legislation	Current Situation
9.	*Directive 1999/93/EC* on a Community framework for electronic signatures	Law no. 455/2001 regarding the electronic signature which sets the legal framework of the electronic signature and of electronic documents, as well as the terms of providing electronic signature certification services This law sets the obligations and the sanctions derived from issuing, storing and archiving/destroying records of electronic signature. The law also provided for the setting up of an Authority for Regulation and Supervision specialized in this field, as well as the rights and obligations of this authority. The same legal act sets the framework of setting up the Register of certification services providers, which is constituted and updated by the specialized regulating and supervisory authority. The Register contains the list of providers of certification services that are based in Romania, as well as of the providers of such services that are based abroad, but are recogniyed bz the Romanian state. of G.D. no. 1259/2001 has approved the operating norms for this law. Law no. 485/2003 for the modification and updating of Banking Law no. 58/1998	Technical and methodological norms for the application of Law no. 455/2001 approved by GD no. 1259/2001	The system of issuing certificates is operational. Until December 2003, 8,000 such certificates have been issued.

No.	European Legislation	National legislation	Secondary National Legislation	Current Situation
10.	Directive 2000/31/EC on certain legal aspects of information society services, in particular electronic commerce, in the Internal Market (Directive on electronic commerce)	Law no. 365/2002 on electronic commerce.	G.D. no 1308/2002 has approved the operating norms.	

Legislative projects

- Law regarding the amendment and addition of certain normative acts in the field of electronic communications and postal services;
- Law regarding the electronic archiving of documents;
- Decision regarding the juridical protection of services that are based on conditional access or consist thereof;
- Decision regarding the Operating norms for applying the provisions of Government Ordinance no. 20/2002 regarding electronic public procurement;
- Order regarding the procedure of application for and issuance of licences for using radioelectric frequencies;
- Decision regarding the norms and procedures that ensure a good functioning of the electronic procedure providing access to the public information and services according to the provisions of Law 161/2003,Title II;
- Law regarding the time stamp;
- Official list of job descriptions and names in the IT sector;
- Rules and regulations regarding the design of web pages for the local and central public administration in Romania;

Chapter 7. Access

The existence and availability of a suitable network for the transport of voice and data and the affordability of its use are an essential factor for the development of the Information Society.

7.1 Legal framework

Through the adoption in 2002 of the European Directives concerning the Information Technologies and Communications, Romania has successfully finalized the legal framework required for completing process of liberalization of the telecommunications market and to temporarily close the 19th negotiation chapter with the European Union. Subsequent to 1990 the Romanian regulations have provisioned the liberalization of the following markets: terminal equipment, data transmission, mobile communications, satellite communications, transport and distribution of radio and television broadcasts and of the fixed line telephony.

An important factor in the evolution of the IS is represented by the existence and accessibility of the population to the ICT infrastructure. By increasing the access to this type of infrastructure, the citizens will be better informed and integrated in the IS. In order to ensure an uniform access to the existing networks, i.e. to the electronic communication services, Law no. 304 on the Universal Service was adopted in 2003. This law sets the framework for the interaction between the network operators, the services providers and the end-users and intents to diminish the differences between the rural and urban areas, stipulating that any user has to be able to use the services with universal access at a minimum quality level and by paying a reasonable tariff.

When analysing the development stage of a country the following aspects are the most important from the access point of view:

- Availability of networks;
- Their quality;
- Their affordability.

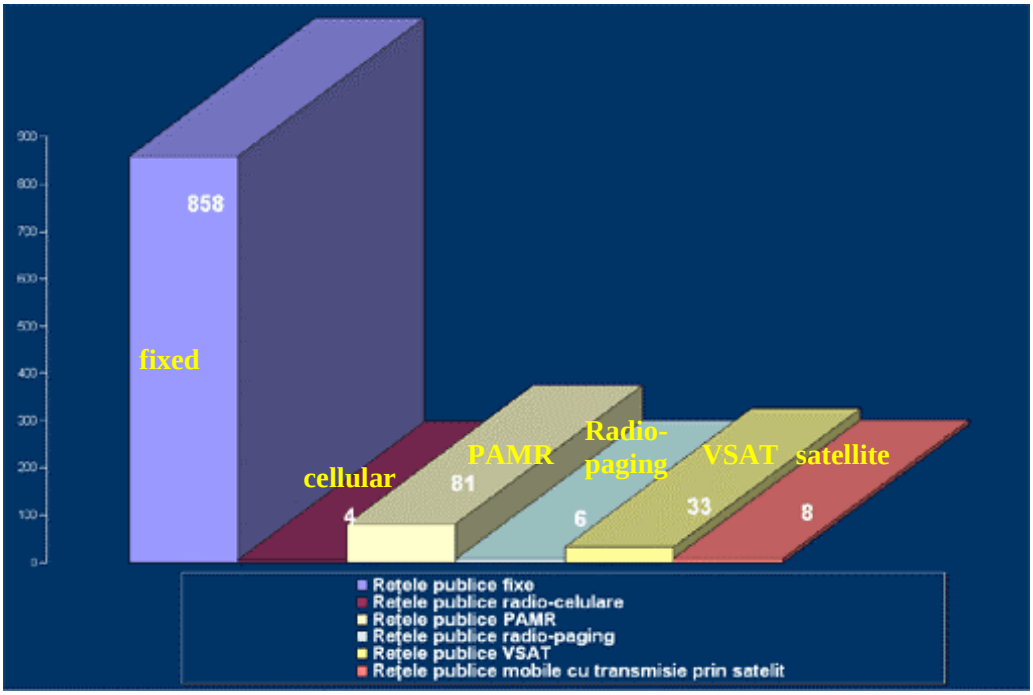
7.2 Networks

The National Communications Regulatory Authority (ANRC) is the institution whose role is to apply the national policy in electronic communications and postal services. ANRC promotes the competition within all sectors of the communications market, stimulates the investment and innovation and protects the rights and interests o the users.

According to ANRC, until 16 January 2004, 1,868 companies have notified the Authority in order to obtain the General Authorisation for supplying services or operating communications networks. From the total number, 1,615 have already received the requested certificate, and thereby the right to enter the market as electronic communication service and network suppliers.

941 companies have been authorised to supply public electronic communication services, of which, as can be observed 851 for fixed line communication services.

Graph 8. Number of authorisations to supply public communication networks by type



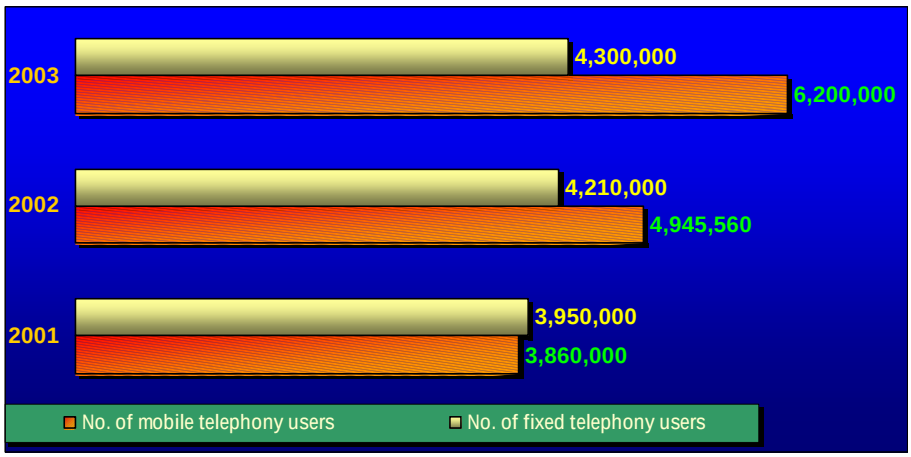
Sursa: ANRC

7.3 Fixed line telephony

The main actor in the fixed line market is Romtelecom, having as main shareholder the Greek operator OTE (54%) and the Romanian State (46%). According to the information posted on Romtelecom web site, as of September 2003, the company has over 4.3 million subscribers, both legal and natural persons. According to the same source, Romtelecom operates a network with a digitisation degree of 74% and an automatisation of 99%, including a fiber optics network of over 30,000 Km. The penetration of fixed line telephony is, as of September, of 21% (number of lines divided by total population) and of 58.1% (number of lines of the individuals divided by the number of households).

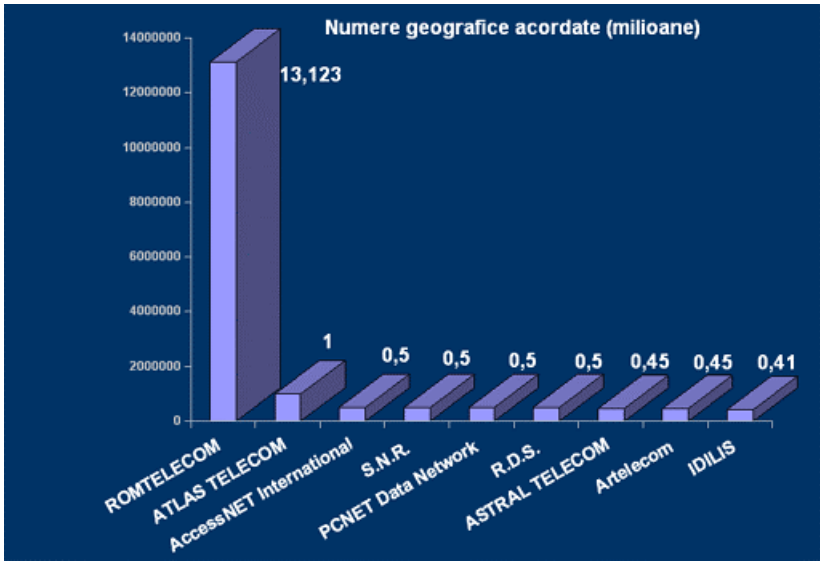
However, fixed phone telephony penetration at household level in Romania is still low, when compared to the values recorded in the other Candidate Countries, where the values of this indicator, for 2002, range between 56.7% in Lithuania and 95.6% in Slovenia. In Romania the waiting list for fixed phone lines is still long (542,060 unsolved applications), with an average waiting time of 2.71 years, according to MCTI.

Graph 9. The Evolution of Telephony Users



After the liberalization of the fixed line telephony in 2003, 179 companies have the right to supply fixed line telephony services. ANRC has reserved for Romtelecom over 77% of the total of fixed line telephony numbers, as can be noted from the following graph. Bearing in mind that the liberalization of this communication service took place only at the beginning of 2003, significant competition is expected to appear on the market shortly. Until December 2003, of the 179 companies that have acquired this right, the only competitors of Romtelecom for local fixed telephony services were Atlas Telecom – a company that offers fixed phone services using DECT technology (low mobility telephony services) and Astral Telecom, national supplier of integrated communication services, that has introduced the fixed telephony service – Astral Telefix (available in 4 towns).

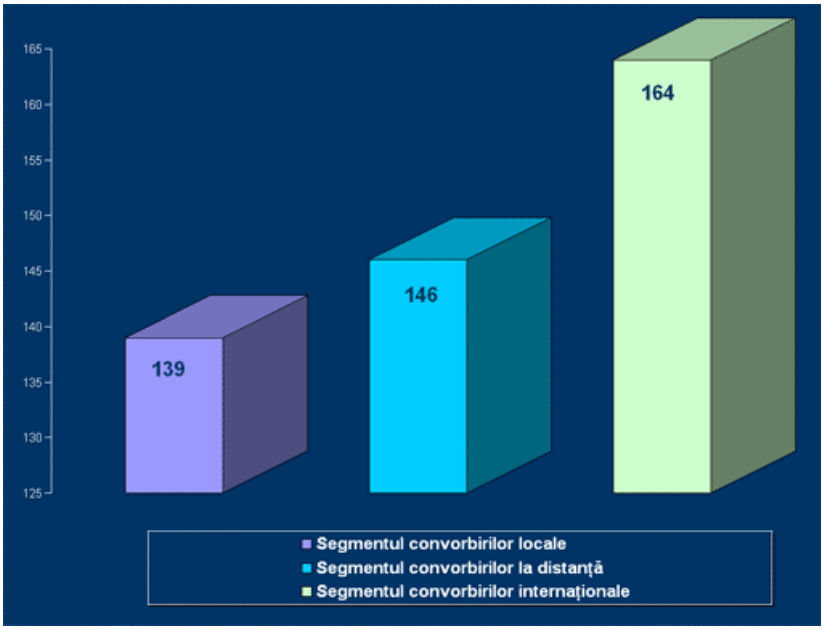
Graph 10. Geographic numbers reserved (million)



Source: ANRC

According to ANRC, the companies that offer or will offer telephony services over the public fixed lines can be characterized as follows (as can be noted from the graph below): **139** companies intend to offer local telephony services, **146** inter-county telephony services and **164** international telephony services. **78** companies intend to install public payphones and **66** will offer ISDN services.

Graph 11. Types of fixed line telephony services



Sursa: ANRC

7.4 Mobile Telephony

The mobile telephony market has recorded a spectacular evolution in the last 5 years. In December 2003, one thirdof Romanians (aged over 15) owned a mobile phone. The geographical coverage of the mobile telephony exceeds 95% of the Romanian territory. During the same period, the number of mobile phone lines exceeded by almost 2 million the number of Romtelecom subscribers. From the 6.1 million mobile phone users (at the end of September 2003[*]) 2.35 million were subscribers and 3.75 million users of prepaid cards. For comparison, in 1996 there were only 20,000 mobile phone users (Telemobil), while in 1997 200,000, after the entering on the market of the first two GSM operators (Mobifon and Mobilrom).

In September 2003, 282 Romanians in 1000 had a mobile phone, whereas in 2002, there were only 172. In spite of this evolution, the degree of penetration of mobile telephony is lower than in other Candidate Countries where this indicator is between 33%, for Bulgaria, and 85% , for Slovenia[**] and the EU average is approximately 72%.Consequently, in spite of the sharpe rise of the penetration of the mobile telephony in Romania, the proportion of the

[*] Data published bz ANRC
[**] For the year 2002, according to the 3rd Report on Monitoring of EU Candidate Countries (Telecommunication Services Sector), prepared by IBM.

mobile phone holders in the total population, in December 2003, was still half of the European average of 2001.

Beside the voice services, which have become very popular among users, the mobile phone operators offer clients other communication services such as SMS (the average number of short messages is around 5 per month and per user, according to information disseminated by mobile phone operators in November 2003), which can also be sent from a PC to a mobile phone as an e-mail. WAP (Wireless Application Protocol) for internet navigation from the mobile phone (on specially designed sites), eBanking, useful in carrying out banking transactions directly from the mobile phone, dail-up Internet connections, HSCSD (high speed data transmissions through GSM) and GPRS (General Packet Radio Service) Internet access, etc.

7.5 Cable TV, Radio

Starting withthe years 1990, the first cable companies began to operate. Initially they were oriented towards expanding their cable networks and reaching a high number of users. When all localities with more than 1,000 households had at least one network (smaller villages did not represent profitable locations for this type of business), cable operators decided to boost their revenues by increasing the complexity of the services offered such as, pay-tv programmes, internet access, fixed line telephony) and by reducing the piracy.

Information published by INS in 2001 showed that, at the end of the respective year, there were over 3.4 million cable TV subscribers, with an average of approximately 300 TV receivers for 1000 inhabitants (85.7 TV sets for 100 househonds) and 3 million radio subscribers with an average of 381 radio sets for 1000 inhabitants (111.8 radio sets for 100 households). According to estimates of the Romanian cable operators, there are currently approximately 4 million households connected to the cable networks (a penetration of 55% of all Romanian households).

The average value of the cable subscription in Romania was of 4.1 Euro in October 2003, less than in any of the other Candidate Countries: 5.7 Euro in Bulgaria, 9.3 Euro in Czech Republic, 9.9 Euro in Poland and 10.1 Euro in Hungary.

In order to gain the highest possible share of the Romanian electronic communication market, the large size Cable TV operators intend to also offer fixed telephony services and Internet connection services (by TV cable, fiber optic, radio or leased lines).

7.6 Other services

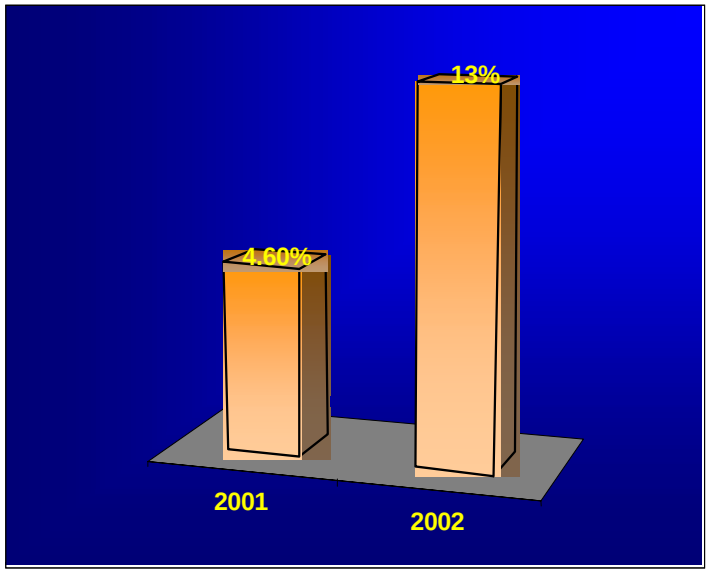
Except of telephony services, 518 companies offer other types of services such as: data transmissions services (371 companies), Internet access (385 companies), professional mobile radio-communications services (85 companies) and radio-paging (5 companies).

7.7 Internet Availability

According to the Romanian National ISP Association (ANISP), in Romania, at the end of 2003, there were approximately 400 ISPs, of which 35 were members of the association.

Dial-up is the main connection method for both households and small businesses, while broadband access through cable networks is increasingly popular. Broadband solutions through leased lines, radio or satellite is also available.

Graph 12. Weight of Internet users in total population



Sursa: ANRC

The major national ISPs are private companies such as:KPN Qwest, Artelecom, RDS, FX, Equant, PC Net, Euroweb and Astral.

In order to gain Internet access, users have various options offered by ISPs:dial-ul, TV cable, fibre optic, leased lines or mobile phone.

Various estimates show that, at the end of 2002, there were approximately 3.6 million* Internet users, which represents an impressive increase considering that, in 2001, the estimates were of only 1 million users**.

The low level of Internet penetration in Romania, compared to other countries or the European average (55% of the total population) could be explained by the limited offer in the field of electronic commerce, the low levels of average income of the population as well as by the relatively low number of PCs in Romanian households.

7.8 Affordability

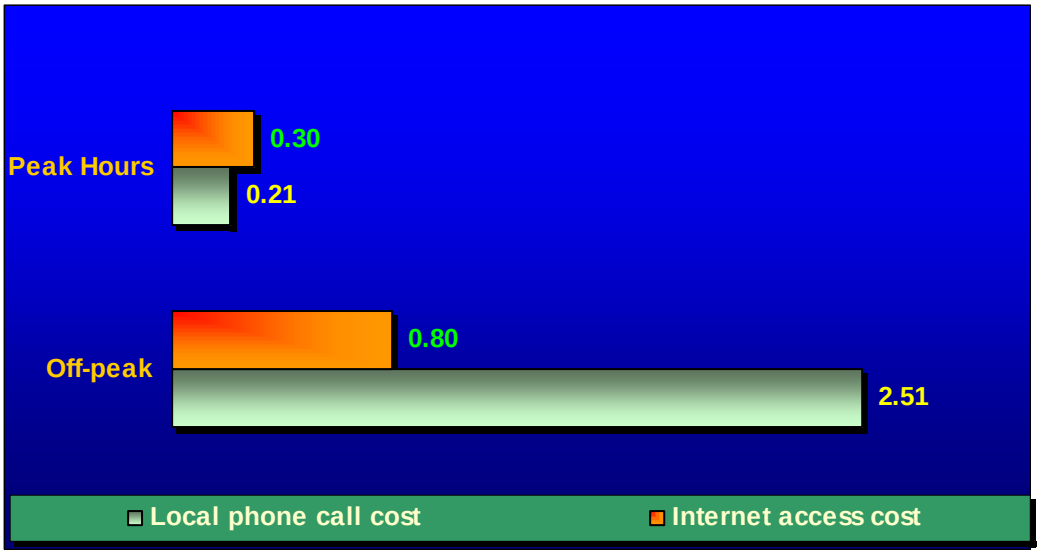
Dial-up

The main costs of dial-up access is the cost of the phone connection and of the Internet subscription.

The cost of phone calls has been considered one of the main obstacles in the way of increasing Internet access. After the conclusion of an agreement between Romtelecom and 193 ISPs, this cost dropped dramatically. Thus, the cost of local costs for Internet access is between 0.3 Eurocents/min (off-peak) and 0.8 Eurocents/min (during peak hours), whereas the cost of regular local calls is between 0.21 Eurocents/min (off-peak) and 3.34 Eurocents/min (during peak hours).

* Sibis (Statistical Indicators Benchmarking the Information Society), Matching up to the Information Society, August 2003
** The World Bank – "ICT at a Glance"

Graph 13. Call Costs (Eurocents/min)



The costs for supplying Internet services varies between EUR 2.6 and 8.69 (USD 3 and 10) depending on the duration and period of Internet access, but, upon contracti other telecom services as well, it is possible to gain free Internet access (the only remaining cost being that of the telephone "call"). The average cost of 40 peak hours of Internet access is of EUR 34.2 in Candidate Countries, whereas in Romania this cost is in average EUR 29.2 (phone call charges included). The average cost of 20 off-peak hours of Internet access os EUR 11.5 in Candidate Countries, whereas in Romania it is in average EUR 7.7 (phone call charges included).

ISDN dial-up access offers bandwidths of 64 or 128kbps, (compared to a maximum of 56Kbps over the classical connection) but is available at higher subscription levels, between EUR 17.4 and 26 monthly (USD 20 and 32) and connection tariffs equal to the classic connection.

Cable

Cable Internet connection cost depends on the guaranteed and maximum bandwidth available and the traffic included in the subscription cost and is between 7.8 (for a 0.5Gb traffic, no guaranteed bandwidth) and 400 Euro (for unlimited traffic and 128kbps, guaranteed bandwidth).

ADSL

Internet through leased lines is available from the major ISPs. The subscription cost is of approximately EUR 400 to which one must add the leased line cost, which depends upon the bandwidth and the length of the line and is around 0.5Euro/km/month.

Radio

In most of the large cities Internet is available also through radio connections in the 3.5 and 2.4 GHz frequencies. The cost of this connection for a 3Mbps bandwidth is of approximately EUR 400 per month, excluding the rent for the communication equipment.

Chapter 8. E-government

The introduction of eGovernment is not an easy process. Providing user-centred services and cutting bureaucracy implies deep organizational change and willingness to rethink established ways of working. Therefore, the introduction of eGovernment often leads to resistance since, while the efforts it requires are evident, it takes some time for its benefits to show. Nevertheless, these benefits play a very important role in Europe's social and economic model by supporting a higher level of welfare for citizens, ensuring socio-economic cohesion and supporting the functioning of a competitive market environment.

The importance of implementing eGovernment was once again confirmed by the Ministers of the EU Member States, Candidate Countries and EFTA Countries that gathered in Como on July 8th, 2003 for the European eGovernment Conference in order to exchange views on implementing eGovernment in the framework of the eEurope 2005 and the eEurope+ 2003 Action Plans. On this occasion, the participating members acknowledged the role of eGovernment as a driver for the modernization of the entire European public sector and as a key in increasing productivity and efficiency of Public Administration, thereby freeing resources and delivering more value for taxpayers' money. Furthermore, the Ministerial Declaration of the Como European eGovernment Conference 2003 emphasized the importance of eGovernment as a means to improve efficiency and transparency in the public sector and the European institutions, and thus increase attractiveness for investment and it pointed out the role of eGovernment as a tool for enhancing the quality of life for European citizens through inclusive public services for all.

8.1 EU Benchmarking Indicators in the field of eGovernment

The European Commission has identified four main groups of user-driven *eGovernment* web sites, as follows:

- Government to Citizen (**G2C**)
- Government of Business (**G2B**)
- Government to Government (**G2G**)
- Government to Employee (**G2E**)

At the same time it has identified a list of public services, **12 for citizens** and **8 for businesses** (detailed in Section 8.3), establishing a unified methodology to assess the level of online availability/sophistication of basic public services, as follows:

- Stage 1- Information: The information necessary to start the procedure to obtain the public service is available online.
- Stage 2 - One-way Interaction: The publicly accessible website offers the possibility to obtain in a non-electronic way (by downloading forms) the paper forms to start the procedure to obtain the service.

- Stage 3 - Two-way Interaction: The publicly accessible website offers the possibility of an electronic intake with an official electronic form to start the procedure to obtain the public service. This implies that there must be a form of authentication of the person (citizen or business) requesting the services in order to reach stage 3.
- Stage 4 - Full electronic case handling: The publicly accessible website offers the possibility to completely treat the public service via the website including decision and delivery. No other formal procedure is necessary for the applicant via "paperwork".

As further recognition of the importance of *eGovernment* and in order to boost the use of Internet, the European Commission, in the eEurope 2005 program, proposes that special attention be given to the following areas:

- Broadband connection established by the EU to be achieved by Member States for all public administrations by 2005;
- Interoperability. The Commission intends to issue by the end of 2003 an Agreed Interoperability Framework to support the delivery of pan-European e-government services to citizens and enterprises. Basically, this recommendation will address information content and suggest technical policies and specification for joining up public administration information system across the EU. Open standards and encouragement to use open source software will be part of the recommendation.
- Interactive public services. According to EC, Member States will have to ensure by the end of 2004 that basic public services are interactive. This measure will require back-office reorganization and also addressing access for people with special needs.
- Public procurement. Member States will have to carry out a significant part of public procurement electronically by end 2005.
- Public Internet Access Points (PIAPs). PIAPs should be accessible to all citizens in their communes/municipalities. An important financing source for the accomplishment of this objective for the Member States are structural funds.
- Trust, Security and Privacy. European eGovernment services can only be fully harnessed if there is confidence that the new information and communication technology is reliable and secure.

8.2 The Romanian National Electronic System

The legal framework regulating the NES implementation process in Romania is mainly provided by Law no. 161/2003 regarding certain measures for ensuring transparency in the exercise of public duties, public functions, in the business environment, for the prevention and sanctioning of corruption, Title II “Transparency in the administration of public information and services by electronic means”. This legal act stipulates the obligation of public institutions to ensure equal, transparent and non-discriminatory access of all citizens and organizations to public services, respecting confidentiality and the protection of private information. At the same time, the abovementioned law unifies the various regulations adopted during the years 2001 – 2002 regarding the e-government concept, defining it as “the utilization, by the authorities of central public administration, of IT based application, for the purpose of:

- Improving access to the public information and services provided by the authorities of central public administration;

- Eliminating the bureaucratic procedure and simplifying work methodologies;
- Improving the exchange of information and services between the authorities of the central public administration;
- Improving the quality of public services at central public administration level."

Law 161/2003 states the obligation of all public administrations to register with NES, such that the latter may become a "one stop shop" solution capable of replacing "physical" interaction between citizens or company representative and the public officer, all the while ensuring transaction security and confidentiality.

Additionally, in order to facilitate the use of NES and in order to boost user trust in the benefits of the services provided by this system, the government adopted GD 1085/2003 for the application of some legal provisions (comprised by Law no. 161/2003 regarding certain measures that ensure transparency in exercising public duties, public functions and in the business environment, corruption prevention and sanctioning), regarding the necessary stages to be undertaken for the implementation of NES both by the institutions of central and local public administration and by the beneficiaries of this system (citizens and business environment).

GD 1085/2003 sets the list of public institutions that have the obligation to register with SEN (included in Annex 3), as well as the list of public services and the forms available in electronic format, and the system registration procedure.

As a further measure to stimulate the use of NES, the abovementioned legal act provides that natural persons may register with NES free of charge, whereas the annual tariff for using the electronic procedure provided by NES to obtain public services was set to approximately EUR 10 for legal persons. Moreover, in order to increase NES utilization by ensuring accuracy of the information supplied to users by means of this system, GD 1085/2003 provides for the obligation of the public administration authorities to forward to the operators of NES, within 48 hours, all updates related to modifications that may have arisen related to forms available over NES, as well as to the procedures that must be follows in order to benefit from public services offered electronically.

In Romania, the National Electronic System (NES) was launched on the Internet in September 2003 and is available over the www.e-guvernare.ro web site, as a unique access point to public information and services, designed both for citizens and businesses. www.e-guvernare.ro offers, since the moment it was launched, 5 electronic services and it allows for 164 standard forms to be freely downloaded. Generally, such forms can then be printed, filled out and sent by traditional means (regular mail or actual submission in physical form) to the institutions in charge, and, in some cases, they can be sent electronically. The forms cover areas of interest like: taxes, pensions, allowances, social security etc. and access to them is allowed without prior registeration by means of a user name or password.

www.e-guvernare.ro contains several sections as: "Forms on-line"(Formulare on-line), „Services on-line" (Servicii online), „Interesting" (De interes), „The Government of Romania" (Guvernul României), „Workplaces" (Locuri de muncă), „Want a home of zour own" (Vrei casa ta?), „Transportation" (Transport), „Consumer Protection" (Protecția Consumatorului), „Documents necessary for" (Acte necesare pentru), and „Your opinion" (Opinia ta).

In order to facilitate contact with the local authorities, NES provides links to some of the city halls, prefect's offices and county councils and thereby, an easier access to documents needed for Urbanism and Constructions, Civil Status issues and Social Protection. The „Public Administration on the Internet" ("Administratia Publica pe Intenet") section facilitates access to local public services and ensures transparency in the fulfilment of the specific attributions of the respective institutions.

In addition, NES provides a set of useful links, among which: www.e-cariere.ro - for job seekers, www.guv.ro - a direct link to the web site of the Romanian Government, www.e-licitatie.ro - the eMarket and eProcurement portal of Romania etc.

There are plans of gradual expansion of the national electronic system by increasing the number of public services offered and the number of forms available in electronic format as well as be increasing the number of NES users. Currently, the maximum level of sophistication of services offered over the eGovernment portal in Romania is available only to 360 large-sized companies in Bucharest and Ilfov, but there is a schedule for extending access to such level of sophistication for a larger number of legal person taxpayers during the next year.

Recent statistics show that, since its launching, NES was accessed 1.6 million times by approximately 50,000 visitors. Numerous opinions regarding the web site have been expressed (through the section entitled "Your opinion") and there is a clear demand for even more diversified online government services and for increased access to NES. Moreover, in the multi-country assessment performed by SIBIS, Romania ranked first with regard to citizens' willingness to interact on-line with the public administration authorities.

Public Procurement Electronic System

One of the projects rolled out under the supervision of MCTI in order to develop on-line governmental services is the public procurement electronic system (PPES), launched in March 2002, available at www.e-licitatie.ro. In order to facilitate access to PPES, the government adopted GO no. 20/2002 regarding public procurement by electronic auctions, approved by Law no. 468/2002, with subsequent additions and amendments, which sets the general framework and the utilization terms for the on-line procedure of attributing public procurement contracts, as well as the general rules to ensure, by electronic means, transparency in the field of public procurement.

Finally, GD no. 182/2002 - regarding the list of contracting authorities that have the obligation to apply the provisions of GO no. 20/2002 regarding public procurement by electronic auctions and the products that can be traded using the electronic procedure - established the list of ministries and their subordinated institutions that had the obligation to employ PPES, as well as the list of product categories that could be purchased using this system at the time.

Moreover, in order to increase trust employing PPES, GD 179/2002 regarding the setting up of the PPES functioning Supervisory Commission stipulated to setting up a supervisory body, the main attributions of which consisted of: ensuring the observance of the basic functioning principles of PPES, solving complaints regarding PPES functioning, validating the rules and procedures set by the PPES operator.

Since the launch of PPES until present, the number of contracting authorities with an obligation to use PPES, as well as the product categories that can be traded using this system, have continually increased. The plans for 2004 include the expansion – practically the generalization – of PPES usage for all public procurements carried out by the authorities of the central public administration authorities.

According to information released by MCTI, the public procurement electronic system (PPES) is currently being employed by 1,000 public institutions and more than 8,000 companies. According to the same source, the number of transactions concluded using PPES has exceeded 200,000, whereas the number of product categories currently being traded over PPES has increased to 80. It is estimated that PPES has allowed savings amounting to approximately EUR 67 million.

The Electronic System for Granting Internetional Merchandise Road Transportation Authorizations

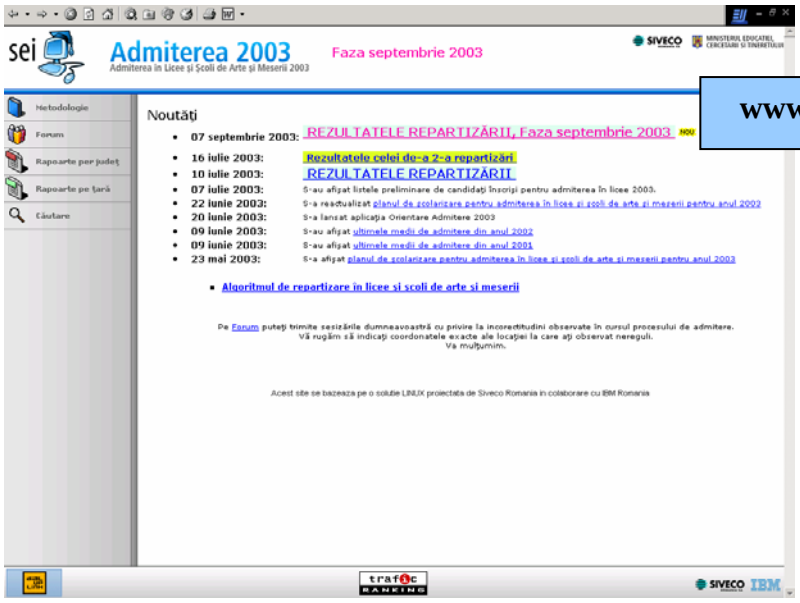
The Electronic System for Granting Internetional Merchandise Road Transportation Authorizations , available over the Internet at www.autorizatiiauto.ro, was launched in November 2003 and its operation is regulated by GD no. 1173/02.10.2003, which ensures transparency in the electronic procedure of granting transportation authorizations. The system operator is the General Inspectorate for Communications and Information Technology.

The application has a public section that all users have access to, after validating the "System Access" option, and where thez can view various pieces of information, as available authorizations, total number of released authorizations, by carrier and by classes of carriers. During November 2003 – January 2004, the system led to the delivering of 50,000 authorizations and was used by 1,500 transporters with digital certificates.

SEI (The Computerized Education System)

During the period 2001 – 2002, a governmental program designed to support the Romanian education system – Computerized Education System (SEI) - was rolled out by MECT. One of the components of this program is ADLIC (Admiterea in licee 2001) – "high-school admission 2001", which was created in order to provide a supporting tool for the computerized admission in high-schools, professional and apprentice schools. The purpose of ADLIC was not only to centralize exam results, but also to record and validate candidate data, as well as to carry out the computerized distribution of candidates among the various educational institutions. ADLIC saved a great deal of time and effort both for organizers and for participants and the initiative received the eGovernment "Best Practice" label at the Brussels eGovernment conference in November 2001.

The www.portal.edu.ro web site, briefly featured below, was set up as a means of communication between MECT and the educational institutions and inspectorates, as well as to provide users with information related to the computerized reform carried out by the Ministry of Education, Research and Youth through programs like SEI and ADLIC.



E-statistics

In order to implement a mechanism for real-time information gathering, the e-statistics program – which is available over the Internet at www.e-statistica.ro - was rolled out during 2003, by MCTI in cooperation with the National Institute of Statistics. According to the relevant regulatory framework (GO no. 19/2003 regarding the obligation of using the electronic statistical data gathering system), the preparation, implementation and deployment of this system are to take place in two stages:

- The implementation stage, initiated in July 2003 and planned to be concluded by June 30, 2004:
- The deployment stage, starting July 1, 2004.

The main legal act regulating the utilization of this system is represented by GD no. 542/2003 regarding the Operating Norms of the electronic statistical data gathering system. According to this GD, in order to use the electronic data gathering system, the reporting institutions that are obliged by law to use the system must register and obtain an electronic identification in

order to gain access to the electronic system and to guarantee the confidentiality of reported data.

The obligation of the central and local public administration institutions, as well as of other public institutions (education, health, culture), to use the e-statistics system is also regulated, by GD no.19/2003 regarding the obligation to use the electronic statistical data gathering system, approved by Law no. 202/2003 for the approval of GD no. 19/2003.

In July 2003, by means of the electronic statistical data gathering system (SIGMA), the e-statistics implementation stage was launched, through 4 surveys, the respondents of which were: Public Administration 2002, Public Administration 2003, IT companies and ISP. The purpose of this stage was to collect, store, process and present data that were necessary for monitoring the evolution of the IT field in Romania, as well as to compute the various indicators showing the stage of evolution in the information society implementation process. The actions undertaken during this stage are closely related to the recommendations included in all the IS related European programs, which underline the necessity for a periodical monitoring of the IS implementation stage, accompanied by a computation of the relevant indicators for the monitoring process, the basis of both processes being the rapid and efficient collection and processing of data. Due to the legal obligation of public administrations to employ the electronic system, responsiveness was considerably higher among such institutions. The processing of the data gathered during the 4 surveys is performed by the National Institute of Statistics and results are expected during December 2003. The National Institute of Statistics will also become the sole proprietor of the system once the implementation stage is completed and will ensure, according to law, the operation of the system and the management of all data gathered by means of e-statistics, during the deployment stage.

Apart from the 3 programs detailed above (PPES, SEI and e-statistics), other steps have been taken in ensuring electronic government services, as follows: e-voting was used during the referendum for the modification of the Constitution in October 2003; a modern system for submitting customs declarations on-line will become operational during 2004 and it is estimated that , by December 2003, 60% of Romanian municipalities had introduced electronic payment systems for local taxes. The list of measures undertaken in the process of implementing the provision of governmental services on-line continues with a series of pilot projects rolled out by MCTI during 2001 – 2003. A list of the most important such projects is enclosed in Annex 4 of this report.

As recognition of the abovementioned progresses, NES received the award for “best e-government digital content” at the World Summit of Information Society held in Geneva in December 2003, occasion on which the world’s best 40 projects – 5 for each of the 8 sections: e-Learning, e-Culture, e-Science, e-Government, e-Health, e-Business, e-Entertainment and e-Inclusion - have been selected from over 800 applications, as being the most representative for the quality level of the Information Society at international level.

8.3 eGovernment Indicators for Romania – Comparative Analysis

A comparative analysis of the current stage of eGovernment implementation in Romania, according to the basic eGovernment benchmarking indicators set by the European Union is presented in the following two tables:

Table 10. Comparative analysis of the eGovernment indicators recommended by the EU – Romania, the UK and Greece

No.	eServices for Citizens	Current Stage in Romania[2]	Current Stage in the UK	Current stage in Greece
1.	Income taxes	**0/4**	4/4	4/4
2.	Job search	**3/3**	3/3	3/3
3.	Social security contributions			
	3.1. Unemployment benefits	**0/4**	1/4	¼
	3.2. Family allowances	**0/4**	3/4	¼
	3.3. Medical costs (reimbursement or direct settlement)	**0/4**	1/4	¼
	3.4. Student grants	**1/4**	2/4	¼
4.	Personal documents			
	4.1. Passport	**0/3**	3/3	1/3
	4.2. Driving license	**2/3**	1/3	1/3
5.	Car registration	**0/4**	2/4	1/4
6.	Application for building permission*	**2/4**	3/4	0/4
7.	Declaration to the police	**0/3** (3/3 for theft or damage of driving license)	3/3	1/3
8.	Public libraries**	**2/3**	1/3	1/3
9.	Certificates	**0/3** (3/3 on a local level for marriage certificates)	2/3	1/3
10.	Enrolment in higher education / university	**3/4**	3/4	1/4
11.	Announcement of	**0/3**	3/3	Not applicable[3]

[2] Information mainly provided by MCTI, since access to some of the web sites is not allowed without prior registration.

* Can be higher in certain cases, since it is practically different for each local administration.

** Stages 2 or 3 do not indicate that the system is generalized, but merely the fact that there are public administrations that offer the respective services at the indicate sophistication level, in some cases only for a small number of companies (large size enterprises) from limited geographical areas.

No.	eServices for Citizens	Current Stage in Romania[2]	Current Stage in the UK	Current stage in Greece
	moving			
12.	Health related services	**0/4** (2/4 for availability of services in certain hospitals)	1/4	1/4

No.	eServices for Businesses**	Current Stage in Romania	Current stage in the UK	Current stage in Greece
1.	Social contribution for employees	**3/4**	3/4	4/4
2.	Corporate tax	**3/4**	1/4	4/4
3.	VAT	**3/4**	4/4	4/4
4.	Registration of a new company	**2/4**	2/4	0/4
5.	Submission of data to statistical offices	**3/3**	Not applicable[4]	1/3
6.	Customs declarations	**3/4**	2/4	2/4
7.	Environment-related permits	**2/4**	2/4	1/4
8.	Public procurement*	**3/4**	Not stated[5]	1/4

[3] In Greece, there is no obligation to officially inform the local authorities of a change of address and therefore the service is not relevant.

[4] UK businesses are not obliged to submit data to the National Statistics Office

[*] Stage 3 reflects the existence of this system only for certain product categories. There are plans for expanding the electronic public procurement system during the next year to cover most public procurement transactions.

[5] There is no national e-procurement platform for the UK central government. However, the OGC operates (through its trading arm OGCbuying.solutions) two electronic catalogue-based procurement schemes, GCat (for IT and Telecommunications products and related services) and S-Cat (for Professional and Business Services). These schemes provide public sector organisations with a simplified means of procuring and contracting for a wide range of services. They can place orders for IT and telecommunications products and related services online, under a series of Framework Agreements signed by OGCbuying.solutions with a number of suppliers. For local government procurement-, the Improvement & Development Agency has developed I&DeA marketplace, a full e-procturement platform to which local authorities in England and Wales can connect to.

Chapter 9. Education and the Information Society

9.1 Brief Overview of the Education System in Romania

After 1990, Romania has been undergoing a complex reform process aimed at implementing the principles of democracy and market economy in all the major economic, political, social and cultural components of its society. Moreover, the recent years following 1989 have been marked by the official launching, in February 2000, of Romania's negotiations for accession to the European Union. Within this process, the Romanian Government has committed to take the necessary steps in order to fulfil a set of "European standards" in the fields considered crucial for the well functioning of a market economy, as well as to achieve the harmonisation of the Romanian legislation in these fields with the Community Law comprised in the *acquis communautaire*. The accession requirements related to one of these key fields have been assumed by Romania in negotiation Chapter no. 18 "Education, Training and Younth".

Within this context, a profound transition process has affected all levels of the Romanian education system, as well as the institutional and legal framework affecting it. The Constitution of Romania (adopted in 1991 and modified in 2003), lays the foundations of the legal framework in the field of education, establishing the right and obligation to study and stipulating that access to public schools is free of charge, according to the law. The legislative acts in the field are mainly represented by the Law of Education no. 84/1995, modified by Law no. 268/2003; Law no. 128/1997 regarding the Statute of the Teaching Staff with subsequent amendments and modifications and the Law regarding the accreditation of high education institutions and the recognition of diplomas – Law no. 88/1993. The main institution governing the field of education in Romania is the Ministry of Education, Research and Youth, that also has the responsibility of ensuring new and efficient structures and mechanisms as framework for implementing the *acquis communautaire* in the Romanian education system.

The Romanian educational system comprised five main levels in December 2003, as follows:

- Pre-school – for children aged 3 to 6/7;
- Primary school – grades 1 thru 4;
- Secondary school:
  - Inferior secondary school – grades 5 thru 8;
  - Superior secondary school (high-school, professional schools, apprentice schools etc.) – grades 9 thru 12/13;
- College (1- 3 years, for specializations established by the Ministry of Education, Research and Youth in cooperation with the Ministry of Labor, Social Solidarity and Family);
- High education: university and post-graduate education (DEA[6], master's, postgraduate academic studies, doctorate, postgraduate specialist courses, specific forms of postgraduate medical education).

[6] DEA – Diplome d'Etudes Approfondis (Studii aprofundate)

The total number of students in Romanian schools and universities for the academic year 2001/2002, as well as the distribution of students by education level is provided in the following table:

Table 11. Total no. of Students in the Romanian Education System during the Academic Year 2002/2003

Total number of students in the Romanian education system, of which:	**4,527,643**
▸ Pre-scool	619,223
▸ Primary school and inferior secondary school	2,347,615
▸ Superior secondary school (high-school)	716,401
▸ High education	563,991
▸ Other types of education	280,413

Source: the National Institute of Statistics

9.2 ICT in the Romanian Education System

When assessing e-readiness in the Romanian Education system, there are a number of specific aspects to consider, such as: the number and training level of ICT specialists that the education system is able to generate, the mobility of labor in the field of ICT, ICT education programs conducted, the level of access to ICT in the education system.

9.2.1 Generating ICT specialists and Mobility of Labor in the ICT Industry

ICT at primary school level

ICT disciplines are not compulsory in the Romanian Syllabus at primary school level. However, statistics show a number of schools connected to the Internet[7], which proves that, although ICT related subjects are not taught as distinct curricular disciplines in all primary schools, there are a number of such institutions where IT Laboratories are in place and pupils are offered acces to computers as well as some basic IT knowledge.

ICT at secondary school level

According to the Curriculum for superior secondary schools established by Order of the Ministry of Education and Research no. 3670/2001, IT is a compulsory distinct discipline for all the categories of such institutions in the Romanian education system. Generally, there is a tradition of excellence in the ICT education among Romanian high-school students confirmed by the remarkable results in the international IT competitions. However, many students with aptitudes in the field are recruited by foreign universities that offer a far more stimulating academic environment and, after graduation, more attractive employment opportunities in the respective countries than could be found in Romania.

[7] See figures in the section dedicated to "Access to ICT in the Education System"

ICT at higher education level

One of the most important transformations that occurred after 1990 impacted mostly the higher education system and referred to the introduction of private education, which has led to a gadual and significant increase in the number of universities in Romania. Thus, according to the Ministry of Education, Research and Youth, there are currently 49 civil public universities in Romania, 18 licensed private universities and 8 military universities.

The explosion in the number of academic centres has implicitly led to an increase in the number of universities offering ICT specialization and to a more uniform geographical distribution of such universities. Thus, academic centres located in Bucharest, Cluj-Napoca, Brasov, Constanta, Iasi, Alba-Iulia, Bacau, Craiova, Pitesti, Galati, Arad, Baia Mare, Oradea, Petrosani, Ploiesti, Sibiu, Suceava, Targoviste, Targu Jiu, Targu Mures, Timisoara etc. ensure an almost complete and uniform territorial coverage of Romania in terms of high education institutions providing ICT specialization. There are several approaches as to which universities are capable of generating ICT specialists. Thus, Order no. 132/2002 of the Ministry of Labor and Social Solidarity, Order no. 76/2002 of the Ministry of Ministry of Communications and Information Technology and Order no. 352/2002 of the Ministry of Public Finance regarding the inclusion in the computer programming activites mentions the following universities that the graduates of which can benefit from the salary tax facilities provided by law:

- Automatics and Industrial Informatics
- Computers, Electrican Engineering and Computers
- Electronics, Applied Electronics, Electronics and Telecommunications, Communications
- Mathematics, Informatic Mathematics
- Informatics, Economics Informatics and Applied Informatics
- Cybernetics and Economic IT, Cybernetics and Economic Forecast, Accounting and Bookkeeping Information Systems.

Although the number of ICT specialists generated by higher education institutions is sufficient to cover the current needs of the Romanian economy, a brief assessment of the regional distribution of ICT companies reveals that highly skilled work force in the field is concentrated in the big cities (especially Bucharest), leaving the demand for such specialists uncovered in rural areas and smaller towns.

At the same time, although the quantitative aspect of ICT work force is adapted to the current needs of the economy, the main concern in the process of harmonization to EU directives in this field is related to the qualitative aspect of the academic and professional training of ICT specialists. Within this context, Romania undertook the engagement of harmonizing the Romanian curricular content in order to achieve the recongnition of Romanian university degrees and diplomas by 2007, which is the expected accession date for this country. At the same time, Romania has adhered to the principles of the "Joint Declaration of the European Ministers of Education Convened in Bologna in the 19th of June 1999", aimed at achieving a unique European space in the field of higher education by the year 2010.

However, the harmonization measures concerning the education system are still in progress and their visible results are only expected to show starting 2007. Some of the so far achievements in this process are: decentralization of the higher education system – by

increasing the autonomy of the faculties, introduction of the transferable credit system; setting national standards for temporary authorization and institutional accreditation of universities; supporting student and teacher mobility programs; introducing the possibility of public schools to enrol students with tuition fees etc.

Thus, one of the important steps in the process of harmonization in the education system was the introduction of the transferable credit system in Romanian high education institutions starting with the academic year 1998/1999. Since its introduction, the European Community Course Credit Transfer System (ECTS) has been the base of all student exchange programs. ECTS is a decentralized system based on mutual trust and confidence between the participating high education institutions, as well as on unitary assessment of student workload. Its rules are defined in terms of Information (syllabus courses available), Agreement (between host and home institutions) and Use of Credit Points (to indicate the student's workload). The maximum number of transferable credit points is set by the Council of each faculty. If a student follows study periods in other universities/faculties (domestic and/or abroad), the credits obtained will be recognized by the home faculty. The total number of credits associated to a university education programme in Romania is set by Government Decision no. 693/2003 to 180 for short-term university study programmes, and 240, 300 or 360 for long-term university study programmes such that, one year of day course study receives an average of 60 credit points.

Thus, ECTS is a tool of validation for each university when comparing its activity to the education process in other universities from Romania and abroad and it ensures a certain level of comparability to European universities. However, the system is still in the process of improvement in order to achieve full comparability of the national and European credit systems.

The participation of Romanian students and members of the teaching staff in international mobility programs starting with the academic year 1990/1991 has also brought an important contribution to the improvement, harmonization and increase in comparability of the Romanian education system in the field of ICT. Mobility programs as TEMPUS, SOCRATES, Leonardo da Vinci, ERASMUS have brought significant benefits to the Romanian education system, both through students and teachig staff that have been part of study programs abroad and through foreign students and teaching staff that have come to Romania.

However, the ultimate quality certification regarding the ability of the Romanian education system to generate ICT specialists would be represented by the recognition of Romanian ICT diplomas abroad, which should represent, at the moment, one of the most important objectives of the reform and harmonisation process in the education system.

The Ministry of Education, Research and Youth plays an active role in the process of recognition of Romanian diplomas abroad and, accordingly, it has signed the Lisboa Convention, April 1997, regarding the recognition of qualifications obtained in the higher education and has ratified this document through Law no. 172/1998.

However, in practice, ICT Romanian diplomas currently have limited recognition among foreign universities. The main issues regarding the achievement of harmonization in the field of diploma recognition are related to the structure and content of the ICT university syllabus. More specificly, the structure still differs from that of most universities abroad in that the five compulsory years of university for technical specializations in Romania, followed by a large variety of post-graduate forms of study should be adapted to the structure stipulated in the Bologna Declaration i.e., a "three cycle" system (the sequence of degrees being Bachelor,

Master, Doctor in Science), in which the fist cycle would only represent 180 – 240 credit points (3 to 4 years) and the main postgraduate education forms would be: DEA, master's, postgraduate academic studies and doctoral programmes. As far as content of the ICT syllabus is concerned, the main difference between the Romania and EU countries is is the balance between theoretical and practical curricular activities. Thus, in Romania, most University Councils set an approximate number of 28 – 30 hours of lecture per week, leaving little room for practical classes, laboratory hours and study cases, whereas in most European countries, theoretical classes are limited to a maximum of 20 hours, the rest being dedicated to practical application and individual study. This situation is mainly caused by the reduced financial sources available for the technical endowment of IT laboratories in mos universities, as compared to higher education institutions in developed countries. Moreover, there are still significant differences in terms of content of the ICT curricula in Romanian universities and universities abroad. Romanian curricula tend to be much broader in terms of encompassing disciplines auxiliary to ICT (such as Physics, Special Mathematics etc.), whereas universities abroad tend to be more focused on the strict scope of ICT achieving a higher degree of specilalization of their graduates in various niches of the ICT field, which allows them to achieve good results in a shorter period of time at their future workplaces.

Practice shows that, due to reasons as the ones mentioned above, there is not a standard approach for the recognition of Romanian diplomas, but rather this process takes place on a "case-by-case" basis, within the legal framework of ECTS based bilateral agreements between certain universities in Romania and abroad. However, in most cases, a certain number of years of study in Romania will be recognized as fewer years of study within universities abroad and Romanian students are often required to take additional exams.

As a conclusion, the qualitative capacity of generating ICT specialists of the education system is still lagging behind the existing and future demand of labor force in this field, whereas the number of ICT specialists, although adapted to the needs of the Romanian society, does not cover demand for work force in the field, leaving a significant divide, from this point of view, between rural and urban areas.

9.3 ICT Education and Research Programs

In order to facilitate the implementation of ICT and to promote the introduction of the IS in the educational system, MECT has supported, in recent years, a series of programs, part of which are described below:

The SEI (the Computerized Education System) Program

SEI is a program initiated by MECT in order to offer an alternative of carrying out the educational process in high-schools. Over 90% of high-schools have been endowed with IT laboratories with 25 work stations – corresponding to the number of student in a class. For this project, a software application was developed in order to support the teaching process and in order to assist in the development of new educational modules by assembling the existing modules or by integrating new ones. The project is in process since its final purpose is to ensure the endowment of all high-schools with such laboratories.

The SEI program has also ensured educational software, apart from endowment with IT platforms in high-schools. For this purpose a favourable environment for alternative computer

assisted methods of teaching was created. At the same time, over 250 lessons have been developed, covering subjects from 8 disciplines of the high-school syllabus.Communication between MECT and the educational institutions and inspectorates is carried out by means of the www.portal.edu.ro portal.

Computerized admission into high-scools and art and apprentice schools

Starting 2001, MECT has developed a computerized system of the candidates in high-schools and art and apprentice schools. The system has continually been improved and has generated good results until present. During 2001 – 2003, the system has been undergoing a continuous process of improvement. The personal information of the candidates is introduced at the subscription centers, validated and signed through the witness copy by the candidate, parent, coordinating professor and principal. A candidate may state up to 350 options of education institutions in the county where he or she subscribes. With the assistance of county school inspectorates, the information is sent on line to MECT. The distribution of candidates is made according to performance results in order of options.

Advantages:

- The possibility for each candidate to reach a place that matches his/her qualification and performance;
- Reduction of waiting time for subscription and ruling aut the need for students to make a trip to the education institution;
- Posting results over the Internet;
- Easy access to statistics regarding the remaining vacancies.

Application designed for filling out vacancies in primary and secondary schools and high-scools

During 2003, the aaplication for filling aut vacancies by unique national contest. The distribution principle is similar as the one for the admission application. The application is based on web technology. The data are introduced in the system by the county inspectorates based on the on-line nomenclators supplied by MECT. In order to ensure data accuracy, the system operators are identified by means of smart cards.

The advantages are similar to the ones of the computerized admission application.

Cisco Networking Academy Program

In 1993, Cisco initiated a project of design and installation of a practical and efficient computer network for various institutions in the education system. However, the setting up of such a network soon generated a need for network administration specialist, which Cisco attempted to cover by setting up a training program in network administration for teaching staff and, later on, for students. The success of these student workshops on network administration determined Cisco to develop a training curriculum that was to be taught in detail, as a new discipline and thus, in 1999 the Cisco Networking Academy Program came into being.

Current Cisco statistics show that Romania ranks 8th of the 100 countries where the Cisco Networking Academy is in place in terms if number of institutions participating in the program. In Romania there are currently 11 regional and 84 local academies in covering a

large number of cities and towns as: Bucureşti, Alba Iulia, Bacău, Baia Mare, Bârlad, Bistrița, Braşov, Buftea, Călăraşi, Câmpulung Moldovenesc, Cluj-Napoca, Constanța, Craiova, Focşani, Galați, Iaşi, Năsăud, Oradea, Piatra Neamț, Piteşti, Ploieşti, Roşiorii de Vede, Sfântu Gheorghe, Sibiu, Sighetu-Marmației, Sighişoara, Sinaia, Suceava, Târgu-Mureş, Timişoara şi Valsui[8].

Starting 2003, a similat program has been put into place in cooperaton with Oracle (**Oracle Internet Academy**), generated by the success of the Cisco program, but also by the remarkable performances of the Romanian team during the Work Shops organized in the United States of America.

Additionally, The Ministry of Education, Research anf Youth supports a number of programs as **ThinkQuest,** an educational competition in the field of web page design, **Info-Educatie**, a national competition dedicated to students with special aptitudes in the ICT field, as well as programs as **EOS (Educating for an Open society)** or **Procter & Gamble 2000**, which are mainly sponsorships aimed at increasing the ICT infrastructure in educational institutions.

9.4 Access to ICT in the Education System

The adoption by Romania of the eEurope+ represents, among others, an engagement to adopt important measures regarding the increase of access to ICT in the education system. Some of the specific actions assumed recommended by the eEurope+ program and assumed by Romania refer to: stimulating the use of Internet in the institutions of the education system, ensuring cheaper and faster Internet acess for researchers and students, as well as supporting all Romanians to participate and work in the knowledge-based economy. Some of the concret mesures to be undertaken in order to achieve these objectives refer to:

- Working towards upgrading national research networks to ensure that researchers and students benefit from powerful networks;
- Establishment of high speed Internet access and Intranets in universities and making available research networks, where appropriate, for use by schools, museums and libraries;

Additionally, in response to the eLearning[9] initiative undertaken by EU countries, the Candidate Countries established measurable, specific objectives to be attained by 2003, some of which are mentioned below:

- Provide all schools with convenient access for teachers and students to the Internet and multimedia resources;
- Ensure availability of support services and educational resources on the Internet, as well as e-lerning platforms, for teachers, pupils and parents;
- Provide trainig for all teachers, in particular adapt teacher curricula and offer incentives to teachers to use and apply new technologies for developing innovative, practical teaching methods;

[8]Source: http://www.cisco.com/global/RO/edu/CNAP_Romania_home.shtml

[9] Initiative undertaken by the EU countries at the European Council in Lisbon in March 2000. The initiative identifies 4 priority lines of action for introducing the education systems into the Information Society: improvement of infrastructures and equipment, a training drive at all levels, development of quality content and services, and cooperation and dialog among the schools in Europe.

- Ensure that pupils have the possibility to be digitally literate by the time they leave school;
- Give the labour force the chance to become digitally literate through life-long learning;
- Significantly increase IT training places and courses;
- Encourage the dissemination of a European diploma for basic IT skills;
- Set up public Internet access points in public spaces etc.

Currently, the total number of education istitutions connected to the Internet of the total number of such institutions is as follows:

Table 12. Total No. of Connected Educational Institutions

	Education institutions connected to the Internet	Total number of education istitutions	% of education institutions connected to the Internet from the total number of education institutions
County inspectorates	47	47	100%
Universities	75	75	100%
High-schools	927	1,365	68%
Schools	1243	12,627	9.8%

Source: the Ministry of Education, Research and Youth (latest statistics)

Additionally, the eEurope and eEurope+ programs recommends that Memeber and Candidate State quantify a set of indicators that can be considered relevant in the process of assessing the access of the educational system to ICT (at each educational level), follows: number of computers per 100 pupils, number of computers connected to the Internet per 100, number of computers with high speed connections to the Internet per 100 pupils. The current level of these indicators in Romania are described in the following table:

Table 13. No of computers/100 students and no. of connected computers/100 students

	University	High-school	School
Number of computers per 100 students	16.7	11	Estimated to be over 2
Number of computers connected to the Internet pe 100 students	12	7.5	Estimated to be over 1

Source: The Ministry of Education, Research and Youth (latest statistics)

Although during the last 2 years, the pace of endowing educational institutions in Romania with ICT infrastructure has recorded a significant increase – currently there are 175,000 PC units reported for the Romanian educational institutions, as compared to 38,000 units in 2001 (according to WB statistics) – the current level of ICT infrastrucure penetration in Romanian schools has only reached a value comparable to the 2001 level of this indicator in CEE countries

9.4.1 ELearning

ELearning is a teaching method that combines learning with modern technology to facilitate the learning process. It generally involves the delivery of learning and training using

electronic media, such as computers, the Internet and intranets, with learning materials accessed from the Web or from a CD via a computer. Typically, tutors and learners communicate with each other using e-mail or discussion forums. Practically, one of the most widely spread forms of eLearning is distance learning.

During the past years, eLearning has also been developing in Romania, as there are currently a number of functional applications in the field, as follows:

- The Virtual Business University (Universitatea Virtuala de Afaceri), available over the Internet at www.uva.ro - an application developed by the National School of Political and Administrative Studies;
- www.academiaonline.ro - an eLearning portal build in partnership by the Institute of Educational Sciences, InsideMedia SRL and the Association for Career Excellecy.

Moreover, many higher education institutions have already adapted to the new tendencies of eLearning by having opened distance learning centres in the towns and cities where such courses could be organized in an appropriate manner. An example in this field is represented by the Academy of Economic Studies in Bucharest (www.ase.ro) that has already 17,000 students enrolled in Open Economic Distance Learning, which is present in 17 towns and cities.

Chapter 10. Society

10.1 The Use of ICT In the Romanian Society

The significant increase of the number of sites with local content has boosted the public's interest for connecting to the Internet. It is mainly used as a communication mean (e-mail and chat) as well as research and publicity tool. During the last few years, over 1 million Romanians have obtained labour contracts abroad, increasing the number of e-mail users, since electronic mail is a more affordable and simple communication method.

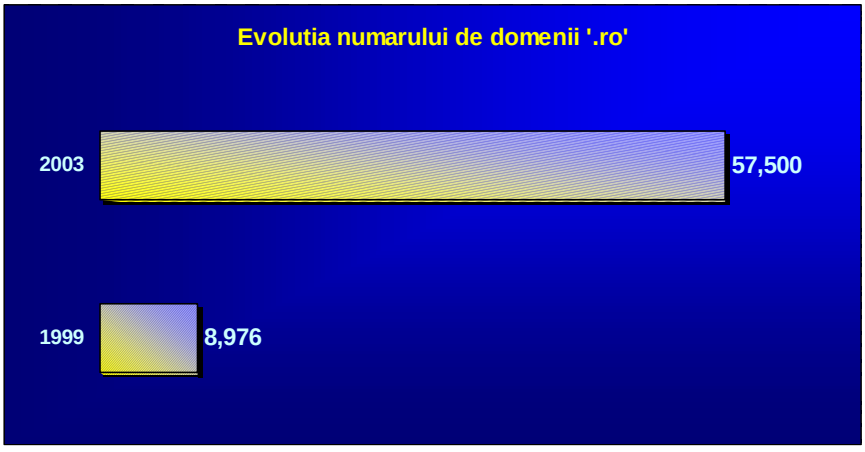
An increased number of businesses and individuals use the Internet for banking operations. E-commerce is mostly popular on foreign specialised websites, while the Romanian e-commerce websites allow only to browse products catalogues and to place orders, payment being made in cash on delivery or in advance through a payment order. Although, the number of companies that use the Internet to present their offer is in continuous increase.

Although the main business communication means are still phone and fax, an increasing number of businesses include at least an e-mail address in their coordinates. There is still a certain lack of confidence with regard to electronic messages and therefore users prefer classical means. Electronic messaging was introduced in central and local administrations, which, as the system is generalized will increase the level of trust in such means among individuals. Also, we must take into account that the fax was first available in Romania only from 1990, and after 5 years all business were equipped with such devices.

10.2 Locally Relevant Digital Content

Stimulating interest for the Internet is based on the existence of content, which has local relevance. Even if the number of „.ro" websites increases constantly there is still a lag compared with other candidate countries or the EU average (3 sites per 1000 inhabitants compared to 37 EU average). Once the electronic payment means will be included, this number should increase significantly.

Graph 14. The Evolution of ".ro" Domains (1999 – 2003)



10.2.1 Dynamic of the Electronic Information Update

Most websites are up to date and present useful information for the users, covering the entire spectrum of the social life The introduction (in September 2003) of the obligation of public administration institutions to update in no longer than 48 hours the information available on their web sites and related to the provision of the 20 basic servies will certainly lead to an increase in the degree of Internet usage as a means of communicating with the authorities.

10.2.2 The Civil Society Online

During the recent years the tendency of many components of the civil society – represented by various associations and foundations: civic and human rights associations, professional associations, student organizations etc. - to gradually incorporate ITC in their activities has become notable.

Thus, most of these organizations and associations are present on-line: www.edemocratie.ro, The eRomania Gateway Association (www.ro-gateway.ro), Pro-Democrația Association (www.apd.ro), The Civil Society Development Foundation (www.fdsc.ro), The Foundation for an Open Society (www.osf.ro), The Romanian Association for Transparency (www.transparency.org.ro) etc.

Other remarkable initiatives in the field are those of the Group for Social Dialog (GDS), that has developed the www.ong.ro portal (intended to be an Internet Communication and Resource Centre for Non-governmental Organizations) as well as those of the Centre for Assistance for Non-Governmental Organizations (CENTRAS) that intends o develop a database for non-governmental organizations, with financing from the Government of Canada.

Another initiative belongs to the Civil Society Development Foundation (FDSC) that has built the Civil Society Catalog in electronic format. This Catalog is also available online since 2002, which gives each organization the opportunity to update their posted data and information themselves.

10.2.3 Portals

Local portals offer links to Internet sites grouped by domains as well as discussion groups and free e-mail services, weather forecasts, local and national useful information and news.

The following are among the popular portals:

www.kappa.ro

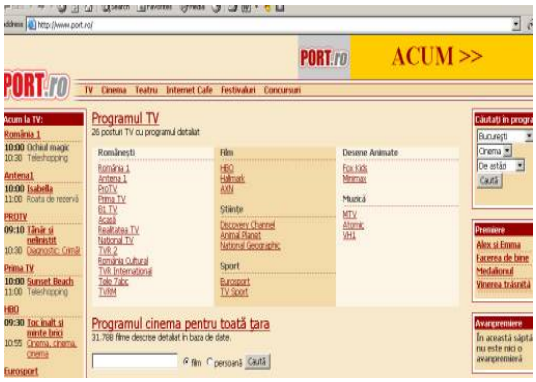
www.bumerang.ro

www.rol.ro

A large number are specialised, offering information, news, discussion groups subjects such as:

- spare time:

www.port.ro offering information about TV listings and cinema programs etc.



www.sapteseri.ro offering information about artistic events, cinema and theatre schedules:

- job offers:

www.bestjobs.ro

www.internetics.ro

sports:

www.onlinesport.ro

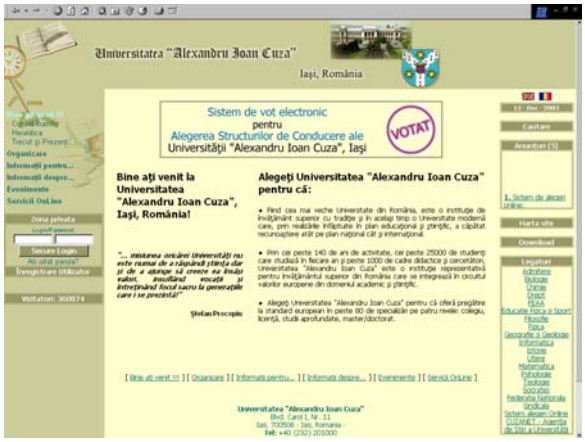
Most large companies have a web presence through own sites while most small business chose to have presentation pages hosted by the chambers of commerce, business portals or free hosting sites. The phone directory (for the incumbent fixed line operator) is available online while many business have contact information listed in directories such as Major Companies of Romania, which are also available on the internet.

10.2.4 University and education

All universities and some high schools and schools have web sites including their curricula, professors' presentation, online courses and other research materials, scholarships in the country and abroad.

Among the most appealing and well-documented educational sites are those belonging to:

PolitehnicaUniveristy: www.pub.ro and Iasi Univeristy : www.uaic.ro



Some education institutions, such as the Academy of Economic Studies from Bucharest are providing long distance learning, including web-based lessons.

10.2.5 Virtual libraries

The main public libraries have websites but only a few have online publications directories or online versions of the books.

Some public libraries are currently organizing their electronic directories. The Romanian Academy Library proposes the electronic version of the works of Mihai Eminescu.

The main universities have organized online libraries with electronic versions of the courses and other scientific works.

10.2.6 Mass media

Most of the newspapers and magazines have an Internet presence, with shortened electronic versions of the current printed issues. All the radio and TV stations with nationwide broadcast and many of the local and regional stations have web pages presenting the programme schedules, the show hosts and even highlights or live streams of their programs.

Among the web pages with a dynamic and rich content in this area are:

www.ziare.com

www.tvr.ro

www.antena1.ro

www.radio21.ro

10.2.7 Public administration

The e-Government chapter highlights the quick evolution of the public administration sites. All the government institutions have now an own site where they present their activity and inform the visitors on the latest news. All regulatory projects are available for consultation online and each public authority presents an email address. In some cases the head of the institution has a separate address where citizens can send requests or raise issues linked to the activity of the respective institution.

www.presidency.ro is the address of the President of Romania, while the activity of the Chamber of Deputies and of the Senate are presented on the sites www.cdep.ro and, www.senat.ro respectively.

www.gov.ro presents the activity of the government and includes links to the sites of the ministries and of the other central government agencies.

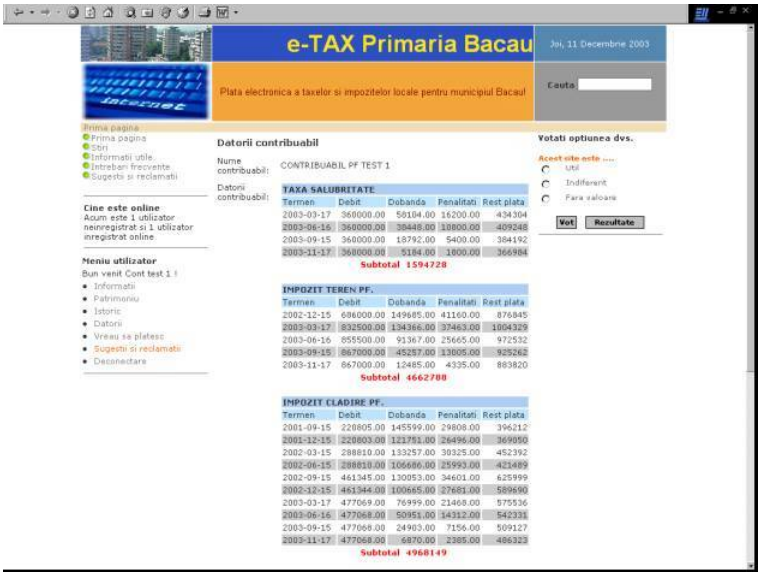
The site of the Public Finances Ministry www.mfinante.ro contains numerous useful information for the taxpayers such as: presentations of the main tax regulations, financial statement of the companies and the budgets of public institutions, forms and assistance software for the computation and declaration of taxes due to the central budget.

The Ministry of European Integration www.mie.ro presents the main documents signed by Romania within the EU accession process, position papers, and periodic reports.

The site of the Ministry of Communication and Information Technology www.mcti.ro presents the main regulatory documents in the field, as well as the legislation proposals of the Ministry, references to the most important eGovernment projects, links to the sites of the relevant trade associations and to the eGovernment portal www.e-guvernare.ro.

A considerable number of local public administration institutions, prefect's offices, city halls, local councils have informative web sites, or even web sites that allow for an interaction between citizens and such institutions.

For instance, the Bacau city hall web site offers information regarding the hours when various services are available, posts various adds, allows access to the data base of regulations issued by the Local Council and the Mayor, allows for audience scheduling as well as local tax payments.



10.3 ICT in Everyday Life

10.3.1 Telephony

Until the liberalization of the telecommunication market, in January 2003, there was only one fixed phone operator in Romania, with a household penetration degree of 53%, below the average of the EU Candidate Countries, but in rise when compared to 2002, when it was 47%. This is also one of the reasons why GSM mobile telephony, that entered the Romanian market in 1997 by the granting of licences to 2 dominating market operators (Mobilrom and Mobifon), recorded a spectacular growth, i.e. 6.92 million users, at the end of 2003, after 6 years of operation. In the case of fixed telephony, the degree of penetration is more reduced in the rural area.

Nevertheless, this is not the case for mobile telephony since most of its clients use the prepaid card system. The low degree of fixed phone penetration, correlated with the monopoly existing on the market until 2003 may be considered one of the main reasons that have been discouraging the use of Internet in households, especially in rural area. Another cause of the increased degree of connectivity to the mobile network was the constant expansion of the geographic coverage area that has currently reached over 90% of the territory and 96% of the population.

The effects of liberalization of the telecommunication market have shown even during this first year of its entering into force by the appearance of the first competitor of Romtelecom in the field of fixed telephony. Thus, Astral, a company ranking top 3 among providers of cable TV programs, has launched a fixed telephony service in some of the municipalities of Romania and over 200 companies have obtained from ANRC licence to supply fixed telephony services.

A very important legal act that is expected to lead to an increase in the number of users of communication services if the Law of Universal Service, adopted in 2003, the operating norms of which are currently being drawn up by MCTI. The main objective of this legal act is to ensure the supply of communication services for a reasonable price. The effort of reducing tariffs for data transmition services in the fixed telephony network have been successful due to the negotiation of an agreement between the association of ISP and Romtelecom, by which the tariff for such services could be substantially reduced as compared to the local phone conversation tariffs. Additionally, for the off peak hours, tariffs are even lower.

10.3.2 Technical Endowment

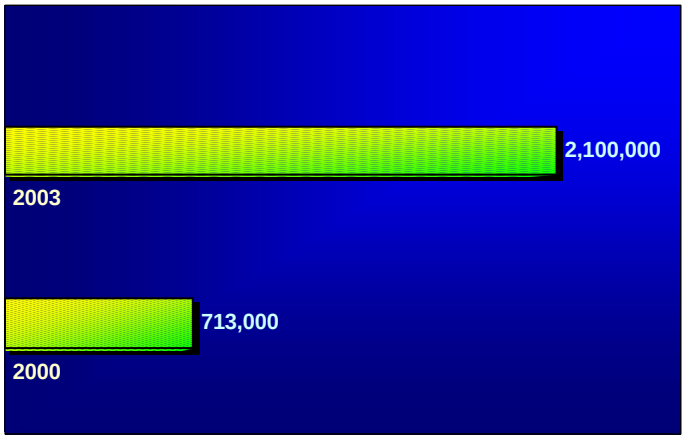
The number of PCs in households has constantly increased in the last years, the level of endowment estimated for households by professional associations in the field and MCTI being of approximately 600.000 PCs from an existing total of 2.1 million PCs[*]. However, when compared to the population, the level of endowment is still below the average of EU Candidate Countries, which can be explained by the gap between the level of revenues in Romania and such countries. Nevertheless, this gap is expected to decrease given the EU integration process of Romania and the conclusion of the economic reform process which are

[*] the estimates belong to MCTI and are based on consultations with associations in the field.

expected to lead to an increase in the competitiveness of the Romanian economy, as well as to a change in its structure, i.e. more focus on services and, implicitly, jobs offering a higher level of remuneration.

Another stimulating factor for the purchase of PCs in 2003 was represented by a decrease in the prices of such products, due to fierce local competition and to local assembling of an important number of PCs, as well as to the introduction of consumer credit systems. These trends will continue in the following years considering that, at the same time, the implementation of electronic government is in process on a central and local level, which will further stimulate interest in connecting to the Internet and, implicitly, in purchasing PCs.

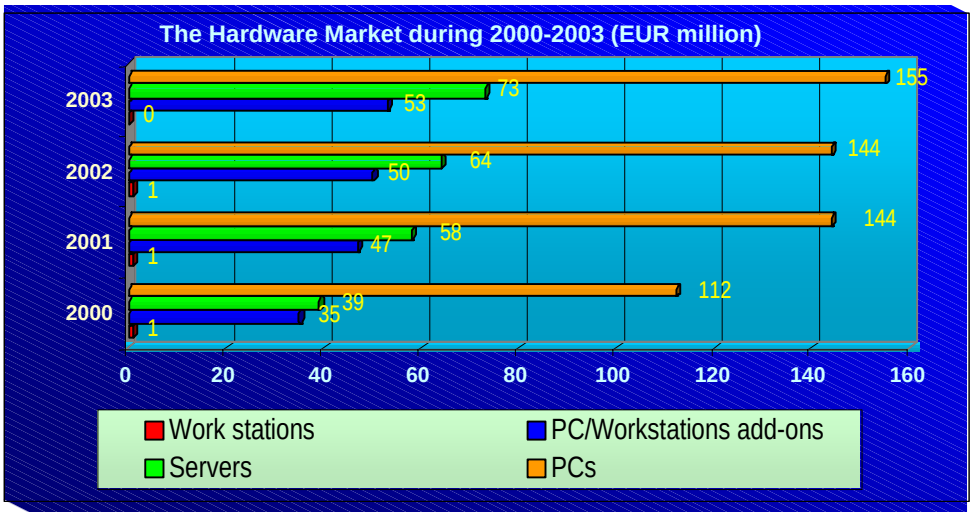
Graph 15. The Number of PCs (2000 – 2003)*



According to the EITO 2003 study, the computer market has been constantly evolving, and has recorded a growth from approximately EUR 187 million in 2000 to approximately EUR 259 million in 2002, and specialists estimate that this trend will continue in the following years at a constant rate, as more and more companies and households will purchase PCs. Considering that total number of households in Romania is 7.2 million and that in Europe the average technical endowment rate is 60%, it may be inferred that approximately 3 million PCs could be purchased by the Romanian population during the next 3 or 4 years, which represents a potential market of approximately 500 million EUR per year, i.e. doubling the current market. Such an estimate is not impossible to reach considering a substantial increase in population income in the perspective of EU integration.

* The estimates for December 2003 were issued by MCTI after consultations with the specialized associations.

Graph 16. The Hardware Market During 2000 – 2003



Sursa: EITO 2002

10.3.3 Public Access Points

Public Internet access points offer the possibility to access on-line resources for persons without computer or connection. According to market studies*, this solution represents the only access way of the population, 45% of the interviewed declaring that they use public Internet access points, as compared to 29% that access Internet from home and 26% that access from work.

The main public points are represented by Internet Cafes, which have recorded a significant development, especially in university centres, but also by the 2800 Post Office points that offer Internet access services, out of 960 Post Office that allow the transmission of electronic messages

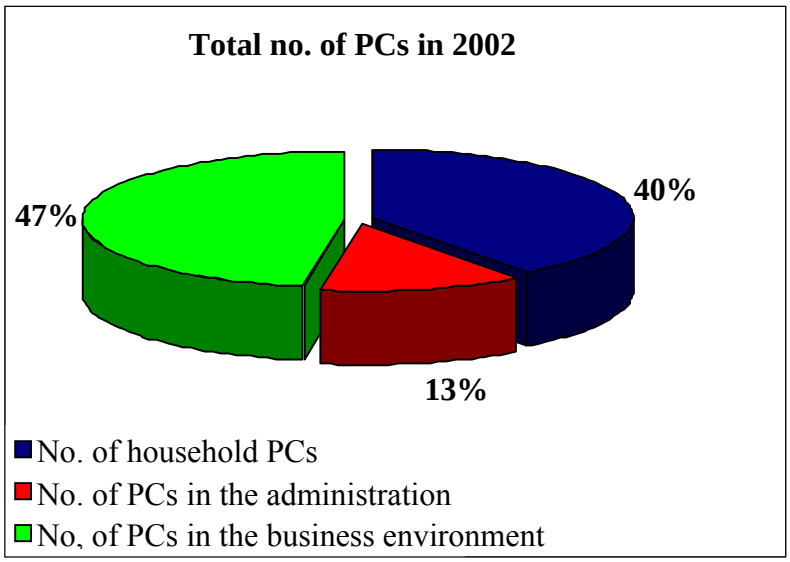
* GfK Romania – The "Internet Monitor" market research

Chapter 11. E-economy

11.1 The Use of Internet in Business

The level of incorporating ICT is currently characterized by the existence – according to information available on the market – of 500,000 PCs in the business environment. Additionally, 85% of the companies have Internet access and approximately 39% of the employees of these companies use the Internet approximately once a week*. According to the Graph below (Graph no.) , 47% of the PCs existing in 2002 were used in the business environment, 13% were used by the administration and 40% in households**.

Graph 17. The Distribution of PCs in Romania in 2002



According to a recent study***, Romania ranked 9th among the 16 CEE countries from the point of view of „.ro" domains. In August 2003, the total number of active „.ro" domains was of 19,000. Russia ranked first with a total of 218,000 domains, whereas the last position was occupied by Bulgaria with only 2,200 active domains. The second place belongs to Poland (149,000 active domains), followed by the Czech Republic (130,000 active fields) and Hungary, which ranked 4th with a total of 79,000 active fields. The last positions in the ranking belong to Croatia (9,000), Latvia (8,400) and Bulgaria.

According to RNC (the authority in charge with the management of allocation of the ".ro" domains), the total number of ".ro" registered fields recorded in September 2003 was 57,500 as compared to 8,976 in 1999, whereas the evolution of IP addresses was from 58,382 in 1999 to 82,095 in 2003.

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* According to information forwarded by MCTI to ITU for the year 2002.
** According to the INS (National Institute of Statistics) survey for the year 2002
*** Reseaux IP Europeens

11.2 Electronic commerce

If the telecommunication sector, especially mobile telephony and software production, have recorded important periods of growth during the last years, electronic commerce and transactions concluded by means of Internet banking are still at the beginning and are expected to take up an ascending trend.

The main factor influencing electronic commerce is represented by the electronic communication infrastructure, but also other factors as: the business environment, the IT skills level of the users, the legal framework, the quality of services offered by local ISP and the degree of acceptance of new technologies by the business community. A part of these factors are already present in Romania: the legal framework is in the process of implementation as the basic legal acts have already been adopted. However, the population has yet to be convinced of the advantages offered by on-line shopping, whereas companies have yet to understand that intensive use of electronic commerce, both for procurement and for sales, is a significant cost saving method.

A study published in 2002*, regarding the development of electronic communication in a group of 4 Candidate Countries (Bulgaria, Croatia, Romania and Slovenia), estimates that the number of Internet users will increase from 2.7 million in 2002, to approximately 6.5 million in 2005. Electronic commerce is still at the beginning in all the four countries, although the study estimates that its value will record a rapid growth, from only USD 30 million in 2001, to USD 650 million in 2005.

During 2001 – 2003, the main legal framework related to electronic commerce and electronic signature was adopted. MCTI is currently in the stage of adopting the secondary legislation necessary for ensuring a reasonable level of trust in the security if on-line transactions. The first step in this process was represented by the adoption of a MCTI Order (according to National Bank Regulation no. 4 of 2002), according to which, banks have the obligation to obtain a licence for the provision of Internet banking and home banking services. Currently (in December 2003), there are 23 banks - of the 39 that are active in Romania - have obtained licence for providing home-banking, Internet banking and mobile banking services.

At the same time, in December 2003, Law no. 485/2003 for the amendment and completion of the Banking Law no. 58/1998 was adopted, allowing banks to use the advanced electronic signature, based on a qualification issued by a qualified certification service provider, in accordance with the provisions of the Law regarding electronic signature (Law no. 455/2001). Some of the benefits of introducing the advanced electronic signature by banks are as follows: cutting costs associated to the printing and processing of documents, more rapid communication with the clients, ensuring data confidentiality, a more fluid document flow as well as better communication between branches, subsidiaries and the headquarters of banks through the communication of documents in electronic format.

Thus, at national level, the legislative acts adopted – the law on electronic commerce, the law regarding the electronic signature, the law amending Banking Law no. 58/1998, introducing the obligation to accept cards by traders with a turnover higher than EUR 100,000 etc., and other initiatives as the actual start-up of the Romanian Credit Office during the second half of 2004 – are measures that will surely lead to a significant increase on electronic commernce in Romania on the short run.

* IDC

At the same time, there are numerous international projects in progress that Romania is actively participating in and that are aimed at supporting companies in harnessing the benefits of the digital economy, especially of electronic commerce, B2B, B2C or G2B.

Thus, within the „eEurope" program, which is aimed at creating a digital Europe, based on entrepreneurial culture, the "GoDigital" component was launched, in April 2001. GoDigital is aimed at supporting companies, especially SMEs, in maximizing the benits offered by the incorporation of ICT and especially *e-business* in their companies. „GoDigital" also proposes specific measures to be taken for this purpose:

- A stable legal and regulatory framework; both internal and for cross-border trading. Such a framework should balance the needs of suppliers and consumers and provide accessible and affordable alternative dispute resolution mechanisms;
- Further liberalization of the telecommunications supply: Liberalization has the effect of lowering prices for Internet access which in itself underpins the adoption of e-commerce;
- Increased use of ICT by governments: More sophisticated and widespread use of e-based services and ICT by national, regional and local authorities would create an incentive for many enterprises to step into the e-business world. In addition, this would provide a mechanism by which firms could reduce their administrative overheads;
- Easier and cheaper access to financing for SMEs displaying a potential for economic viability.

The initiatives proposed by „*GoDigital*" can also be found in the strategy of the Romanian government related to the implementation of the information society, approved by GD 1440/2002, which acknowledges the impotance of supporting SMEs in the process of implementation of the IS and stipulates a set of measures designed specifically for this sector: development of information system for SMEs, supporting the setting up of SMEs in the field of ICT, a technological support program for high-tech activities in SMEs, as well as a program for developing managerial culture among SME owners and their employees with regard to the use of ICT as an instrument of business promotion. The strategy also stipulates measures designed to support SMEs in building and maintaining own web sites – especially for the presentation of products and services of exporting companies – as well as for the promotion of digital economy in business (e-business, e-commerce).

Apart from the *GoDigital* program, the main purpose of which is the implementation of ICT in SMEs, almost all programs tailored for the SME sector contain a component designed to support the implementation of the IS. Thus, one of the initiatives promoted by Romania *"The IVth Multiannual Programme for Enterprise and Entrepreneurship with particular reference to Small and Medium-sized Enterprises (2001-2005 "* adopted by the Council of European Ministers, addressed both to Candidate Countries and Member States. This program comprises two components designed for financing initiatives in the field of technology:

- I-TEC: the initiative entitled "Innovation and Technology Equity Capital", aimed at encouraging investment in technologically innovative SMEs at an early stage by supporting venture capital operators (it is managed by the European Commission in collaboration with the EIF;

- Technology performance financing (TPF) : TPF supports technological projects by SMEs by encouraging commercial banks to contribute toward the financing of such projects.

11.2.1 B2C Electronic Commerce

The EU defines electronic commerce as the transation in which both placing the order and paying it take place over the Internet. At the same time, the OECD is more flexibile, as the defining criterium for this organization is represented by the method of placing and receiving the order, not by the payment method.

Currently (as of December 2003), Romanian virtual traders only offer transaction in which only browsing products catalogs and placing orders are possible online, as payment still takes place by traditional methods.

The Romanian web sites that allow the ordering of products on-line may be grouped as follows:

- Specialized web sites, belonging to companies that carry out their activity exclusively by means of this distribution channel: www.emania.ro, www.digitalworld.ro, www.raft.ro;
- Electronic commerce web sites of "traditional" trade companies: www.domo.ro, www.flamingo.ro, www.itshop.ro, www.diverta.ro;

The hardware trade companies (Flamigo, Best Computers, Caro, Tornado, etc.)have a noticeable presence from the point of view of electronic commerce web companies and the recent appearance of e-commerce companies that offer a wide range of products (emania, rate.ro, price.ro), the core business of which is, mainly, the trading of home appliances.

As previously shown in the section entitled "Society", such web sites do not currently allow the conclusion of transactions by electronic means, instead orders are paid for either in cash when the package is received by the customer or by an advance payment by means of payment order.

One of the most important impediments refers to the "cash culture" that is still dominant in the Romanian mentality and the low level of involvement of Romanian commercial banks in the efforts undertaken by the government to reduce cash transactions and increase the employment of cards. However, on the short term we estimate a positive change as the merchants will be forced to accept card payments if their turnover wood exceed 100.000 EURO. Currenlty (December 2003), there are still major utilities companies such as Petrom and Electrica etc. and at public administration pay desks that have not installed POSs, a situation that should immediately be remedied.

11.2.2 B2B Electronic Commerce

Development of B2B is still rather limited, as it implies the existence at the business entities of a complex, integrated financial and commercial management systems that can be inter-connected by specific platforms. Thus, B2B will only record and increasing trend when the number of companies with such platform reaches a critical mass, i.e. enough B2B transactions for their benefits to become evident for all other market participants.

Currently, the main incentive for B2B development is the employment, by the public administration authority, of the G2B Public Procurement Electronic System (PPES). It is expected that, as the PPES will be generalized during 2004 (by the inclusion of all institutions and categories of products and services), B2B electronic commerce will also increase significantly, which will stimulate its use by SMEs.

11.2.3 e-banking, the Availability of Electronic Payment Methods

According to data published by the National Bank of Romania for the month of June 2003, in Romania there were 4.2 million active cards (as compared to 15.5 million in Poland which has a population of 39 million inhabitants), over 2,200 active ATMs for cash withdrawal (as compared to 6,476 in Poland) and over 6,600 POSs installed at traders and at commercial banks' headquarters. According to Romcard – one of the Romanian card processing centres, at the end of October 2003, there were over 9,500 locations where card payments were accepted, which represented an 8% in the number of such locations, during a 3 month interval. The cards accepted by such terminals are issued under the Visa and Mastercard signs, except for Tiriac Bank POSs, which also accept American Express, Diners Club and JCB.

Due to low personal incomes and to the few merchants that have installed POSs, most card owners use such devices only to withdraw money from ATMs. Nevertheless, it is expected that, once the obligation to accept card payment is in force for all companies with a turnover higher than EUR 100,000, starting January 1, 2004, the weight of ATM card transaction will gradually decrease.

Although the number of Internet users is still relatively low when compared to the total population and to the European average, banks and on-line traders have been promoting a series of services which prove the preoccupation for development in this field. One of these services refers to the appearance of cards, for Internet payments. Currently, only 3 commercial banks offer such cards: Banca Românească (Visa Virtual), the Romanian Commercial Bank (BCR Visa Virtuon) and Banc Post (Taifun virtual). There is a limited number of banks that offer, under certain terms, credit cards in ROL and hard currency, but they are very restrictive and therefore the number of users is insignificant. There are 50 hard currency on the market, issued under the Visa (32), MasterCard (14) and American Express (4) signs.

Chapter 12. Annexes

Annex 1 – List of Acronyms;

Annex 2 - E-readiness Assessment Grid using the „Readiness for a Networked World" Methodology;

Annex 3 – List of Public Adminitration Authorities with the Obligation to Use the Electronic Procedure to Provide Public Services and Information, according to GD 1085/2003;

Annex 4 – List of Pilot Projects Rolled out by MCTI during 2001 – 2003;

Annex 5 – Success Stories of the Information Society Implementation Process;

Annex 6 – List of Information Society Indicators;

Annex 7 – List of Tables Included in the Report;

Annex 8 – List of Graphs Included in the Report;

Annex 9 – Bibliography;

Annex 1 – List of Acronyms;

Annex 1 – List of Acronyms

List of Acronyms (in alphabetical order)

ACC	The Cable Communication Association
ADSL	Asymmetric Digital Subscriber Line
ANIS	The National Association of the Software Industry and Services
ANISP	The Romanian National Internet Service Providers Association
ANRC	The National Regulatory Authority for Communications
APDETIC	The Association of IT&C Equipment Producers and Distributors
ARIES	Romanian Association for Electronic and Software Industry
ATM	Automated Teller Machine
CAEN	The Classification of Activities in the National Economy (of Romania)
CDMA	Code Division Multiple Access
CEE	Central and Eastern Europe
EC	The European Commission
ECTS	European Community Course Credit Transfer System
EFTA	The European Fair Trade Association
EU	The European Union
FDI	Foreign Direct Investments
GD	Government Decision
GDP	Gross Domestic Product
GEO	Government Emergency Ordinance
GPRS	General Packet Radio Services
GPTI	The Romanian Information Technology Promoting Group
GSM	Global System for Mobile Communications
HSCSD	High Speer Circuit Switched Data
IAP	Public Administration Informatization
ICT	Information and Communication Technology
INS	The National Institute of Statistics
IS	Information Society
ISDN	Integrated Services Digital Network
ISP	Internet Service Provider
IT	Information Technology
LAN	Local Area Network
MAI	The Ministry of Administration and Interior
MCTI	The Ministry of Communications and Information Technology
MECT	The Ministry of Education, Research and Youth
MFP	The Ministry of Public Finance
MIE	The Ministry of European Integration
MS	The Ministry of Health
NATO	North Atlantic Treaty Organization

List of Acronyms (in alphabetical order)

NES	The National Electronic System
NMT	Nordic Mobile Telecommunications
OECD	Organisation for Economic Co-operation and Development
OTE	Hellenic Telecommunications Organization
PC	Personal Computer
PPES	Public Procurement Electronic System
RoEduNet	Romanian Education Network
SEI	Computerized Education System
SIBIS	Statistical Indicators Benchmarking the Information Society
SME	Small and Medium Enterprises
SMS	Short Message Service
UMTS	Universal Mobile Telephone Service
VPN	Virtual Private Network
VSAT	Very Small Terminal Aperture
WAP	Wireless Application Protocol
WB	World Bank
www	World Wide Web

Annex 2 - E-readiness Assessment Grid using the „Readiness for a Networked World" Methodology;

Annex 2 – E-readiness Assessment Grid using the „Readiness for a Networked World" Methodology

1. Network Access

	Information Infrastructure	Internet Availability	Internet Affordability
Stage 1	Access to telecommunications infrastructure is very poor. (Roughly: There are very few shared facilities for telecommunications access. Telephone penetration is very low, with a teledensity of less than 2 mainlines per 100 people. Mobile wireless penetration is below 0.5% of the population. No cable services are available.)	There are no Internet Service Providers (ISPs) offering local dial-up access. There is no public Internet access. Businesses are unable to lease dedicated lines from the local telephone operator, or there is a multi-year wait to do so.	Most users are charged long distance or international rates for dial-up access. ISP rates are so high that few individuals can afford Internet access.
Stage 2	A small minority in the community has good access to the telecommunications network, but most of community does not. (Roughly: Teledensity is between 2 and 8 mainlines per 100 people. Mobile wireless penetration is between 0.5% and 3%. Cable penetration is below 5% of all households in the community.)	A limited number of Internet Service Providers offers local dial-up access. There are more than 1,000,000 inhabitants per local ISP. Some providers offer only e-mail services. There are limited opportunities for public Internet access. Users often have difficulty establishing a dial-up connection to a local ISP. There is no competition in commercial leased line provision. Businesses may only lease lines from a single telephone operator.	Rates for local telephone calls are high enough to discourage extensive Internet use via local I SPs, even among most who can afford Internet access. Local access solutions exist, but rates for ISP services are high enough to discourage extensive Internet use. The lack of competition in the provision of commercial leased lines is reflected in prohibitively or very high leasing fees.

Network Acces – continued

	Information Infrastructure	Internet Availability	Internet Affordability
Stage 3	A sizeable portion of the community has good access to telephone services. Growth in mobile wireless telephony is accelerating. (Roughly: Teledensity is between 8 and 40 mainlines per 100 people. Mobile wireless penetration is between 3% and 14%. Between 5 and 10% of households in the community subscribe to cable services.)	There are between 500,000 and 1,000,000 inhabitants per local ISP. ISPs provide full Internet access. Subscribers may have some options between various Internet service packages. There are some opportunities for public Internet access. It is normally possible for users to establish a dial-up connection to a local I SP, except during peak hours. One or two private providers leased lines to businesses.	Telephone charges for Internet access reflect emerging competition in the telecoms market, yet they are high enough to discourage extensive use by some users. Internet access is priced within reach of the majority of citizens. Competition in leased line provision for businesses has been introduced, and prices are falling but are still high.
Stage 4	There is widespread access to telecommunications and network services. (Roughly: There is high teledensity of 40 mainlines or more per 100 people. Penetration of mobile wireless telephony is high and growing, with at least 14% of the community subscribing. Cable penetration is high, at 10% of households or higher.)	There are more than two local ISPs per 1,000,000 inhabitants. Higher bandwidth solutions such as DSL (digital subscriber line) and cable modem access are available. Most customers can tailor services to meet different demands for speed, service, security, quality and cost. ISPs provide web-hosting services to their subscribers. There are adequate opportunities for public Internet access for those without access at home, school or work. Users are able to establish a dial-up connection to a local ISP on a reliable basis. Multiple private providers leased lines to businesses. Wireless solutions may be available in addition to fixed line solutions.	Prices for telephone usage are set competitively and are affordable for nearly all citizens. Flat rate pricing may be in effect for local telephone calls. Prices for Internet access are set competitively and are affordable for nearly all citizens. Flat rate pricing may be available. Free ISP services may be available, particularly in communities with time-metered pricing of local phone calls. Higher bandwidth solutions such as DSLservices and cable modem access are priced competitively, which may include tiered pricing based on speed of access or usage-based pricing based on total volume. “Always-on” connections are available without time-metered pricing. Pricing for leased business lines is set in a competitive environment featuring multiple vendors.

Network Access - continued

	Network Speed and Quality	Hardware and Software	Service and Support
Stage 1	Fewer than half of all domestic telephone calls are successful. For voice telephony, sound quality is often not acceptable for regular conversation. More than 100 faults are reported per year for each 100 telephone mainlines. No services beyond limited electronic mail capabilities are supported by the local telecommunications infrastructure. Large businesses that want access must link their networks directly to infrastructure backbone outside their community.	There are no distribution/sales points for ICT hardware/ software within the community. ICT hardware and software are too expensive for all but large businesses and a small minority of citizens and small and medium-sized businesses.	Telephone mainlines take at least four years to be installed from the time their orders are placed. It takes over six months for reported mainline problems to be resolved, if ever. Very few or no software developers, programmers or computer technicians are present in the community.
Stage 2	50-70% of domestic telephone calls are successful. Dropped connections are frequent and extremely disruptive. For voice telephony, sound quality is acceptable for regular conversation. Between 50 and 100 faults are reported per year for each 100 mainlines. The telecommunications infrastructure in most areas of the community supports dial-up modem transfer speeds of 9.6 Kbps or less. Some areas may support speeds of 14.4 Kbps. Large businesses and ISPs can link their networks to a local infrastructure backbone, but backbone capacity is frequently inadequate to support user demands. Packet loss is significant and regularly disruptive for any online activities.	Some off-the-shelf hardware and software solutions are available locally, but there are none or very few in the native language of the community. Basic hardware and software are affordable for some citizens and small and medium-sized businesses.	Mainlines take at least six months for installation. It takes over one month for reported mainline problems to be resolved. Providers pay no explicit attention to customer service. A small community of software developers, web designers, network administrators and other technical personnel exists.

Network Acces - continued

	Network Speed and Quality	Hardware and Software	Service and Support
Stage 3	**70-90%** of domestic telephone calls are successful. Connections are dropped with noticeable frequency and are somewhat disruptive. Fewer than 50 faults are reported per year for each 100 mainlines. Users have access to dial-up modem transfer speeds of up to 28.8 Kbps. Leased lines with transfer speeds of up to 64 Kbps are widely available for businesses and ISPs. Limited higher-speed lines are available in some areas. Backbone facilities serving the community are usually sufficient, although regular peak demand periods result in slower network response times. Packet loss by the network may occur but is not generally disruptive.	Most ICTproducts are sourced from abroad, but there is a strong and growing localization industry to adapt products to local needs. Some software appropriate to local needs and languages is available. A variety of hardware and software solutions are available and affordable to most small and medium-sized businesses, as well as many individuals.	Mainlines take at least one month to be installed. It takes over one week for reported mainline problems to be resolved. There is a growing customer service ethic among service and support providers, although it is not a priority for most. Some ICTmaintenance and technical support services are available. A nascent software industry is present in the community, and there is a growing number of hardware technicians, Web designers and network administrators.
Stage 4	Dropped connections are fairly infrequent and not a major disruption. Over 90% of domestic telephone calls placed are successful. Fewer than 10 faults are reported per year for each 100 mainlines. There is widespread access to dial-up modem transfer speeds up to 56 Kbps, with some access to high speed solutions such as DSL, cable modems and wireless media. High speed services of 1.5 Mbps are common, with higher speeds available in some areas. Adequate backbone capacity exists to support community needs without significant transmission delays except during infrequent periods of high demand. Packet loss by the network is below 10%.	A vibrant marketplace exists for software and hardware with a competitive retail and wholesale market for these products. Hardware and software appropriate to local needs and languages are widely available and affordable.	Mainline installation is usually completed within a few days. Service providers can be contacted in a number of ways (e-mail, telephone, mail). Reported problems are usually resolved within 48 hours. Online help is available and may allow for immediate resolution. Customer service is considered a source of competitive advantage for the service provider. ICTmaintenance and technical support are widely available. A competitive and sophisticated web design market exists, incorporating the latest development technology.

2. Networked Learning

	Schools' Access to ICTs	Enhancing Education with ICTs	Developing the ICT Workforce
Stage 1	There are no computers in schools.	Computers are not used by any teachers or students.	Training opportunities for programming, maintenance, support, Web design and other ICTprofessions are virtually non-existent.
Stage 2	Where there are ICTs in schools, it is primarily at the university level, and there are generally fewer than five computers in a school or faculty. Access to the computer(s) is limited to computer teachers and/or administrators. Computers tend to be older generation models, such as stand-alone 486 PCs or the equivalent. Where there are multiple computers installed, they are not networked. Use of the computer(s) is limited to electronic documents that are available on the hard drive or diskettes. There may be connectivity for store-and-forward e-mail.	Only a few teachers use computers in a very limited fashion. Teachers' basic computer literacy involves skills such as use of the keyboard and mouse, a basic understanding of the computer's operating system, manipulation of files, and cutting and pasting. Computers are mainly used at the university level.	There are limited opportunities for training in ICTskills development.

2. Networked Learning - continuation

	Schools' Access to ICTs	Enhancing Education with ICTs	Developing the ICT Workforce
Stage 3	Computers can be found at the university level as well as in primary and secondary schools. Up to 10 to 15 computers can be found in laboratories for classroom group work, with about four students per computer. Computer labs are generally only open for computer studies during the day and closed after school, or may be open to teachers for class preparation but closed to students. Computers tend to be older generation models, such as 486 PCs or higher, and they may be networked with a file and mail server. There may be an internal Local Area Network (L AN) in place. If there are multiple computer labs, they may be connected through the school network. Where there are stand-alone PCs, they may have a limited CD-ROM library. The networked lab achieves connectivity through a dial-up connection to the Internet, which supports limited World Wide Web access.	Teachers and students use computers to support traditional work and study. Teachers who use computers are generally proficient with word processing applications and may access information offline from CD-ROMs. They may employ computers in some basic drill-and-practice lessons. In some cases, teachers access and organize information from the World Wide Web in their work, share information using e-mail, and create information in electronic format to share with others both inside and outside the school.	Technical classes and programs on ICT-related subjects are available from a variety of public and private centers. Some limited online access to training is available. Some employers offer training in the use of information and communication technologies to their employees.
Stage 4	Most schools at all educational levels have access to computers. There may be a number of computer labs in each school, and computers may be found in the classroom. In some cases, students and teachers may have individual laptop computers. Computer labs are open to students and reserved for subject matter classes to use, and are open after school hours. The lab may be open to the community and other schools after school and on weekends. There may be an internal Web server on the school network - computers as well as other devices are connected to the network. Classrooms may be wired and connected to the school's Wide Area Network (WAN). Clusters of schools may be connected to a regional WAN to share electronic resources. A national school network may be in place. Connectivity may be obtained through a leased line or wireless connection with at least 64 to 128 Kbps of dedicated access.	Information and communication technologies are fully integrated into the curricula, are used in the classroom and are essential to the learning process. The curricula may feature collaborative, project-based learning activities that enable students to use the Internet and advanced software skills to work with other students and teachers in their school, outside their community and internationally. Teachers are well trained in methods for incorporating computers and ICTs into their instruction and curricula.	There are many technical schools with specialized curricula in information and communication technologies and computer science. There are a variety of training opportunities relating to information and communication technologies available through vendor certification programs, employers, educational institutions, private training centers and distance learning courses. Online resources and courses are widely available for the development of technical skills.

3. Networked Society

	People and Organizations Online	Locally Relevant Content	ICTs in Everyday Life	ICTs in the Workplace
Stage 1	Most of the population has never heard of the Internet. Less than 0.05% of the population has used the Internet at any time during the past three Months. No business entity in the community has a registered Internet domain name.	No websites exist providing information on local topics. Few or no websites are available in local languages or a dominant Web language spoken locally.	Members of the community do not normally employ information and communication technologies in their daily lives. Most social communication is paper based and/or oral.	Employees have limited access to telephones. A small minority of business and government offices has at most a few computers, none of Which are networked. Most business communication takes place in person or by mail. A small number of businesses use telephone and fax.
Stage 2	Much of the population has never heard of the Internet, and most people do not know anyone who has ever used it. Less than 0.5% of the population has used the Internet recently, and few are regular users. Some local businesses and institutions have registered domain names. There are fewer than two of these domains per 1000 inhabitants. There is no advertising in traditional media for online companies or resources.	Few websites covering local topics exist, and most of them are created and hosted outside the community. Some websites are available in local languages or a dominant Web language spoken locally. There is little use of online bulletin-board systems, Usenet groups, newsletters, and/or listservs.	Information and communication technologies (telephones, fax machines, pagers, computers) are used to a limited degree by some members of the community. Public telephones are available in some parts of the community and are used regularly by many community members. Personal computers with e-mail capability are made publicly available by some businesses, but most users are from outside the community (e.g. tourists and visiting businesspeople).	Organizations achieve sporadic efficiency gains through limited deployment of ICT systems in their internal workings. Some employees have access to telephones. Few offices have computers that are networked for internal file sharing and basic enterprise applications. In offices where there are computers, only some employees use them for their work, though not for electronic communications.

3. Networked Society - continuation

	People and Organizations Online	Locally Relevant Content	ICTs in Everyday Life	ICTs in the Workplace
Stage 3	Most of the population has heard of the Internet, although few have used it. Less than 10% of the population uses the Internet regularly. The overwhelming majority of Internet users are males between the ages of 10 and 35. The number of registered domains locally is at least 2 per 1000 people. Advertising in traditional media for online companies or resources is infrequent.	Some local websites are available, though most carry static content and are updated infrequently. Websites carry diverse types of information relevant to different groups within the community. Many websites are available in local languages or a dominant Web language spoken locally. There is some use of online bulletin-board systems, Usenet groups, newsletters, and/or listservs. There are opportunities for Web-related training, although they may be expensive and accessible only in certain areas.	Public telephones may be found in most parts of the community and are heavily used. Some members of the community have Internet access at home. Growing numbers of community members use telecenters, cyber cafes and other businesses that offer computer use and online services to the public for a fee.	Organizations achieve some efficiency gains through some degree of deployment of ICT systems in their internal workings. Many computers in business offices are internally networked for data processing, management reporting, and other enterprise applications. Some employees conduct research and business transactions over the Web, though most often they use a shared workstation to do so. Some employees use e-mail for internal communications.
Stage 4	Most of the population is interested in using the Internet and knows others who do. At least 10% of the population accesses the Internet with some regularity. Males between the ages of 10 and 35 no longer represent the overwhelming majority of Internet users. The number of registered local domains is at least 20 per 1,000 population. Advertising in traditional media for online companies or resources is fairly common.	Many websites provide dynamic information on local topics and are updated at least several times per week. Local content is generated by citizens at all levels of society, including websites and online bulletin-board systems, Usenet groups, newsletters, and/or listservs. A significant amount of information is available through websites in local languages or a dominant Web language spoken locally. Many affordable opportunities exist for Web-related training.	Many members of the community use information and communication technologies (wireless phones, digital assistants, pagers, personal computers) to assist in their personal lives. Many members of the community use information and communication technologies for household commerce (online shopping, banking, investing) and for a variety of social and commercial interactions with other people (including bartering, consumer-to-consumer trade, online chat). Citizens without access through home, school or work use a variety of public and private Internet access options, including online cafes and community centers.	Organizations achieve major efficiency gains through widespread deployment of ICT systems in their internal processes. Computers in offices are fully networked. Different office locations are connected to each other through external networks. These networks may extend nationally or internationally. Most employees have Internet access from their own workstations. Most employees have their own e-mail accounts for internal and external communications. Workers commonly list their e-mail and website addresses on their business cards.

4. Networked Economy

	ICT Employment Opportunities	B2C Electronic Commerce	B2B Electronic Commerce	E-Government
Stage 1	Few, if any, local businesses hire workers on the basis of their technical background.	No businesses in the community operate websites. There is little awareness of online business, and all dealings between businesses and consumers consist of oral and/or paper-based transactions.	Businesses have few sources of market Information. The efficiency of most B2B Interactions is hampered by this lack of transparency, as are prospects for new business opportunities. B2B transactions are carried out in person or remotely through paper-based transactions.	No government resources are online. There is no awareness of online government, and all dealings between government and citizens or businesses are in person or paper-based. There is limited information available by phone.
Stage 2	Although there are some employment opportunities that call for technical skills, most workers with ICTexperience either must leave the community to find employment or are unable to find work in their field.	Some local businesses operate websites. The basic information they provide is static and infrequently updated. Some businesses accept orders placed by telephone or fax. Some businesses distribute hard-copy catalogs for remote browsing of goods and services.	B2B interactions remain inefficient with little transparency. Faxes and telephones are commonly used to facilitate orders or for remote client support, although some paper-based transaction (e.g. signature) is required.	A few governmental websites exist, providing basic information, often directed at parties outside of the community. This information is static and infrequently updated. Some limited interaction with the government is possible by telephone or fax. The government distributes some information about services, procedures, rights and responsibilities in hard copy.

	ICT Employment Opportunities	B2C Electronic Commerce	B2B Electronic Commerce	E-Government
Stage 3	Technical skills in the community are becoming a source of competitive advantage and are beginning to attract investment and employment opportunities by companies from outside the community.	Many businesses post key information on websites. Information is often not kept current and relevant. Websites provide information on goods and services for sale. Purchases take place primarily in person, by fax or by telephone, though electronic mail may expedite the process. Some businesses may have introduced online ordering.	The deployment of electronic systems has increased efficiency and transparency and lowered transaction costs in B2B interactions. Some B2B transactions are supported by electronic systems (e.g. proprietary systems and databases), but some paper-based transaction (e.g. signature) is usually required at some point. Electronic B2B transactions are a small percentage of overall B2B commerce.	Some governmental agencies post key information on websites, including directories of services, hours of operation, and downloadable forms. Information is often not kept current and relevant. Transactions take place primarily in person, by fax or by telephone, though electronic mail may expedite the process. The government manages relationships with some contractors and suppliers online or with other electronic mediation.
Stage 4	A significant number of employees in the community require technical skills to perform their jobs. A sizeable portion of the community's economy is based on the management of and trade in information, employing a large number of "knowledge workers". Information and communication technologies are considered central to the strategies of many organizations.	Many businesses in the community have incorporated the World Wide Web into their sales, marketing, and customer service systems. The total volume of online retail is a noticeable component of the community's commercial activity, as may be evidenced by advertisements for commercial websites in traditional media and other indicators.	Much efficiency in B2B transactions is apparent as a result of the deployment of electronic systems. These efficiencies have changed market structures and redefined industry practices. Many businesses have incorporated the Web into sales, procurement and inventory management. Some transactions occur online over automated, fully-integrated systems. Order processing and delivery may be executed electronically and monitored through online tracking systems. Overall levels of electronic B2B transactions are a noticeable and growing percentage of total B2B transactions within the community.	All governmental agencies post key information on websites and some have incorporated the Web into their strategy for interaction with the public. Interactive government websites allow the public to conduct transactions (e.g. apply for permits, pay taxes) online. Much government procurement and many interactions with suppliers take place online or with other electronic mediation.

5. Network Policy

	Telecommunications Regulation	ICT Trade Policy
Stage 1	There are no plans for the liberalization of the community's telecommunications sector. There are no regulatory provisions that promote universal access to telecommunications services. All services are provided by a single operator, whether private or state-owned. Voice and data service offerings are limited.	Trade in equipment for information and communication technologies is impeded by high tariffs and other restrictions, including cumbersome technical standards or licensing requirements. Service sectors are not open to trade, creating a barrier for electronic commerce and the building and operation of ICT networks. Domestic regulations may create de facto trade barriers for ICTuse. There is little or no foreign direct investment.
Stage 2	Plans for the liberalization of telecommunications services are in place or are being formulated. Provisions for universal access to services have been established, though they are ineffective.	Trade barriers for ICTequipment have been reduced, but are still relatively high. There has been some opening in service sectors related to electronic commerce and ICTnetworks. Foreign direct investment is allowed in network sectors under certain conditions.
Stage 3	Plans for the liberalization of the telecommunications sector are in place and are being implemented. Progress is being made in achieving universal access, but there are many hurdles in implementation. Services such as data, paging and mobile telephony are available from competing private providers. Alternative carriers compete for private network services, leased lines and other telecommunications services for businesses. Incumbent provider networks are being opened to competition through interconnection and/or unbundling obligations.	Trade in ICTequipment is not restricted through unnecessary standards or licensing requirements, and tariffs are low and uniform. The community has at least temporarily agreed not to apply disproportionate tariffs on electronically delivered products. There has been significant opening in services that facilitate electronic commerce and building and operations of ICT networks, but some restrictions remain. Foreign direct investment in the ICTsector is encouraged with some restrictions.

5. Network Policy - continuation

Stage 4	The telecommunications sector has been liberalized, with a regulatory regime in place to promote open competition. Regulation is effective in promoting universal access. An independent regulatory body sets and enforces telecommunications regulations. Citizens and businesses have a number of options for their telecommunications and data services. Incumbent networks have been opened to competitors, and new competing carriers are taking advantage of these arrangements to offer services. There is vibrant competition among mobile wireless providers. Spectrum has been allocated consistently with international standards, and licensing arrangements encourage new market entrants. The provision of value-added services such as broadband Internet is recognized as a source of competitive advantage.	If tariffs exist on ICTgoods, they are low and uniform. Trade in services is fully liberalized, including services delivered electronically. The community has explicitly affirmed that it will not apply disproportionate tariffs on electronically delivered products. Foreign investment in the ICTsector is encouraged and subject to few or no restrictions.

Annex 3 – List of Public Administration Authorities with the Obligation to Use the Electronic Procedure to Provide Public Services and Information, according to GD 1085/2003;

Annex 3 – List of Public Adminitration Authorities with the Obligation to Use the Electronic Procedure to Provide Public Services and Information, according to GD 1085/2003

No.	Public instiurions and authorities	Subordinated institutions
1.	Ministry of Public Finance	
2.	Ministry of Labor, Social Solidarity and Family	2.1. National Agency for Employment
		2.2. National House of Pensions and other Social Insurance Rights
		2.3. Territorial labor inspectorate
		2.4. National Authority for Handicapped Persons
3.	Ministry of Health	3.1. District Public Health
4.	National House of Health Insurances	
5.	The Body of Expert and Licensed Accountants of Romania	
6.	Ministry of Education, Research and Youth	
7.	Ministry of Transport, Construction and Tourism	
8.	Ministry of Administration and Internal Affairs	
9.	Bucharest Town hall	
10.	Ministry of Communications and Information Technology	
11.	Ministry of Justice	11.1. National Trade Registry of Commerce
12.	National Regulatory Authority in Natural Gas Sector	
13.	Ministry of External Affairs	13.1. Department of External Commerce and Economic Promotion – License Division
14.	Regie autonomous „Official Gazette”	
15.	National Regulatory Authority for Communications	
16.	Ministry of Public Defense	
17.	Ministry of Agriculture, Forestry, Water and Environment	
18.	Ministry of Economy and Commerce	
19.	National Agency for Small and Medium Enterprises and Cooperation	
20.	Ministry of European Integration	
21.	Prefects’ offices	
22.	District committees	
23.	General Council of Bucharest	
24.	Local town councils	
25.	Local urban councils	
26.	District town halls	

Annex 4 – List of Projects Rolled out by MCTI during 2001 – 2003;

Annex 4 – List of Projects Rolled out by MCTI during 2001 - 2003

4.1. List of pilot projects rolled out by MCTI in 2001

No.	Pilot projects rolled out in 2001
1.	Multimedia centers for citizens
2.	Unique identification of the public officers through electronic signature and smart cards
3.	Cash flow management
4.	Payment of the taxes and duties through electronic ways (e-tax-payment)
5.	Management of the documents within MCTI
6.	Financial integrated system as management instrument for MCTI's administration
7.	Information audit system for the security of the information systems and communications networks
8.	Informational system regarding the implementation stage of e-Europe+ and of the IT development.
9.	IT system for the notification of the domicile address changing
10.	IT system for job searching „e-Job"
11.	Electronic system for public acquisitions – e-Procurement
12.	Electronic Referendum
13.	Web system for the taking over of suppliers' invoices
14.	Extension of the IT system for the follow-up of the balance sheet and fiscal obligations of the economic agents having abilities for WEB statements.
15.	Virtual market – goods and services acquisition system.
16.	Video conference organized through web
17.	Electronic informing services for citizens – info Kiosks
18.	Internal communications network for MCTI
19.	Informational integrated system regarding the national communications.
20.	Informational system for the supervision of electronic signature. Suppliers.

4.2. List of pilot projects rolled out in 2002

No.	Pilot projects rolled out in 2002
1	Portal containing public administration forms regarding the relation with the citizen and business environment.
2	Portal for the access to e-Government services
3	Extension of the M.C.T.I. site
4	Extension of the system related eEurope+ indicators
5	Online requests portal for the renew of the driving license
6	Portal containing information regarding the health services (interactive advices regarding the services availability within different hospitals, hospitals scheduling)
7	Development of an informational system for the Regulation Authority and Supervision of the Certification Services Suppliers
8	NATO portal
9	IT system for the report of apparently illegal actions within services and informational society fields.

4.3. List of projects rolled out by MCTI in 2003

No.	Projects rolled out in 2003
1	National Electronic System
2	Portal containing administrative on-line forms
3	Online requests portal for the renew of the driving license
4	Development of the informational system for the Regulation Authority and Supervision of the Certification Services Suppliers.
5	Portal containing information regarding the health services.
6	Portal for the access to e-Government services
7	Electronic bidding system for public acquisitions – e- Procurement
8	IT system "e-Job" for jobs searching
9	Multimedia centers
10	Extension of the IT system for the follow up of the balance sheet and fiscal obligations of the economic agents having abilities to take over the documents through WEB.
11.	Unique identification of the public officers through electronic signature and smart cards
12.	Cash flow management
13.	Management of the documents within MCTI
14.	Payment of the taxes and duties through electronic ways (e-Tax)
15.	IT audit system for the information security and communications networks systems
16.	Electronic informing services for citizens – info Kiosks
17.	Web system for the taking over of the suppliers' invoices
18.	Electronic system of the public opinion research.
19.	Electronic system for goods and services acquisitions – eMarket
20.	IT system for the notification of the domicile address changing
21.	Informational integrated system regarding the national communications Infocom
22.	Informational system regarding the implementation of e-Europe+ and IT development
23.	Financial integrated system as management instrument of MCTI's administration
24.	Program of automating and developing the services of Romanian public libraries – Phase III: Virtual Library in the Bucharest Metropolitan Network – The Ministry of Culture
25.	"Virtual Legislative Library" System – The "Official Gazette" Autonomous Regie
26.	Web based Videoconference.

Annex 5 – Success Stories of the Information Society Implementation Process;

Annex 5 – Success Stories in the Information Society Implementation Process

1. IT projects developed by the Ministry of Health and Family[10]

Standards and settlement for developing IT products for public health			
Object	**Technical data**	**Applicable with**	**Results**
An efficient system for emergency medical services for the optimisation of the resource allocation process and for the ambulance service management.	It is available in Bucharest from 1996 and in other seven cities from September 2000. It covers a wide range of ambulance activities from call centre activities to cost calculation.	At the Bucharest Ambulance Service and in other seven large cities: Craiova, Cluj-Napoca, Constanta, Iasi, Oradea, Timisoara and Târgu Mures. It was presented in an eHealth conference *ICT for Health*, Brussels, 22-23 May 2003.	It is operational 24 hours per day. The main benefits for the medical system are: - Significant decrease of the period between the emergency call and the moment the ambulance starts (less than 2 minutes); - The decrease of the intervention period to 10 minutes in cities with ambulance services and to 30 minutes for other situations; - Increase of the medical service quality; - Non-stop use of the ambulance service.
Standards for developing IT products for public health			
Object	**Technical data**	**Applicable with**	**Results**
Develop a database with national and international standards and regulations (definitions, classifications, codifications etc.) in order to ensure coherently statistical reporting systems and healthcare services system. Public access to this database is provided through the internet.	Financed under the VIASAN programme, through the Medical Science Academy. The database is accessible at this address: www.ms.ro/ccssdm/std/start.htm. The conformity certification is performed at the IT centre of the Ministry of Health.	The standardisation activity has been achieved with the support of Ministry of Health and Family, public health services, Romanian Standardisation Authority, Health software companies and professional associations (ARIES).	Through the website the information was released to public access. The email was used to reply the requests formulated by the health related software developers.

[10] Source: Ministry of Communication and Information Technology

IT systems for hospitals			
Object	**Technical data**	**Applicable with**	**Results**
Development of IT systems for the management of patients, observation sheets, medical investigations and treatments, management of drug consumption, human resources, admin activities and accounting etc.	In the past, the Ministry of Health had the most IT project initiative for hospital IT systems. Later, independent companies in relation with Ministry of Health has started to implement such systems. At this time there is a high number of IT solutions for hospitals, from which some with a big success implemented in various hospitals.	**Big IT performant solutions exists in almost 60 out of 442 hospitals in Romania (plus 4 private hospitals).**	A better patients evidence, a better resource management. A better cost control made by the hospital management. Reducing costs through a better control on resource allocation.
The IT system for healthcare management			
Object	**Technical data**	**Applicable with**	**Results**
IT systems for health care management, achieved under the World Bank strategy for health sector development, and afterwards discussed within the commission that represents all the involved parts – Ministry of Health, CNAS, Medical College.	The IT pilot project for the sanitary sector has been achieved with World Bank support and was implemented between 1997 and 1999. It have been installed over 1000 servers and computers, other equipment and the related software.	The information systems has been installed to the Ministry of Health, all the Public Health Services, 34 ambulance stations, 95 rural health centres and to all medical institution from Neamt county.	- Ensuring communications between the top management levels; - Designing a website for the Ministry of Health and for CSSDM, through which statistical data and WHO programs can be found; - Finacial data processing at the Ministry level and in other institutions (SAP programme); - Statistical databases and modern instruments for decision making process; - Pilot IT systems for medical institutions.
The international project EUPHIN - EAST			
Object	**Technical data**	**Applicable with**	**Results**
A statistical reporting system for medical indicators of the countries in the European zone of World Health Organisation.	**Financed by the EU, realised through the bureau of World Health Organisation for Europe. There were 23 countries who participated in this programme.**	The present IT application has completed the one achieved before (EUPHIN) for the Western Europe Countries. At this time hundreds of health indicators are available for all the WHO European countries and can be	- Very good accessibility and real time access to the latest data related to health sector, the allocated resources, social factors etc, for all European countries using the internet;

	Romania was represented by Ministry of Health and by CSSDM.	visited at this website: http://www.who.dk/hfadb. From this website, the database and the HFADB statistical product can be downloaded for free. The product is updated twice per year by WHO with the support of all the involved countries, including Romania.	- The possibility to study a wide range of indicators and its evolution in the last 30 years; - Program products for statistics, including maps, charts and the possibility to compare countries or the selected periods.

2. IT projects developed by the Ministry of Economy and Trade[11]

Information system for debt compensation process

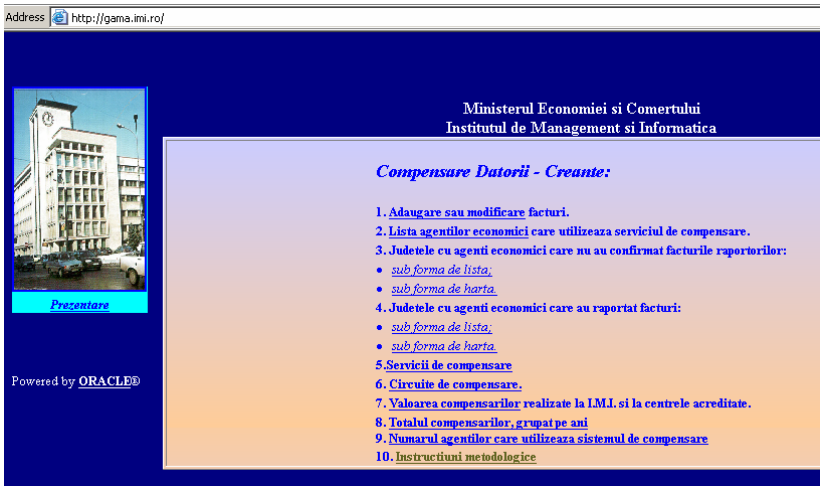
Objective – Decreasing the level of bad debt collection

Action - Companies are submitting through the internet, information about the unpaid invoices older than 30 days and with a total amount greater than 100 million ROL, which contains the unique identification code of the reporting firm and of the creditor/debtor firm, the invoice series and number, date and invoice amount.

The Institute of Management and Informatics and the General Direction of ICT from the Ministry of Economy and Trade are managing all the information introduced into the system through a database, based on Oracle 9i technology and identifies the compensation circuits.

The companies involved in this process are indicating the circuits they want to use for compensation and issues the compensation order that has to be signed by all the representatives of the companies involved in this compensation circuit.

The website is accessible at this internet address: http://gama.imi.ro



Results: A decrease in the level of bad debt collection with 16 billion USD in the last 4 years. Also, the system represented a good motivation for companies to use the internet, in this way over 18.050 companies have accessed the website and over 14.200 agents made compensations

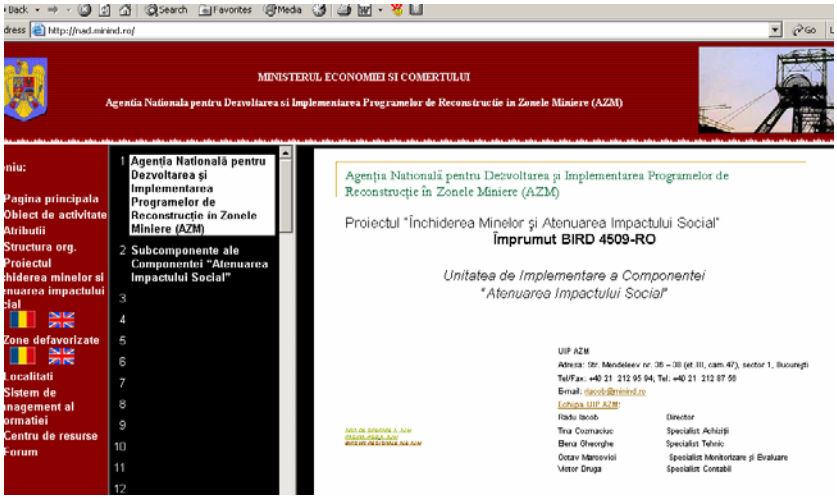
[11] Source: Ministry of Communications and Information Technology

IT system for information management "Mine Closure and Social Mitigation Project"

Objective: The Romanian Government received a loan from the International Bank for Reconstruction and Development in order to implement a Project Mine Closure and Social Mitigation. The project is the first phase of a long-term strategy for the restructuring of mining sector in Romania, eliminating subsidies and securing the long-term viability of the mining sector.

Starting date: 27 January 2000

Ending date: 31 December 2004



Technical data: The Institute of Management and Informatics, the ICT division in the Ministry of Economy and Trade, realized a web site (http://nad.minind.ro), through which, upon authorization and depending on different user access rights, information can be introduced in the system, from any of the 14 territorial and regional collectives or by the different project subcomponents contractors. Certain users can download from the centralized database to a local database for specific components.

Results: until present, the following components have been realized:

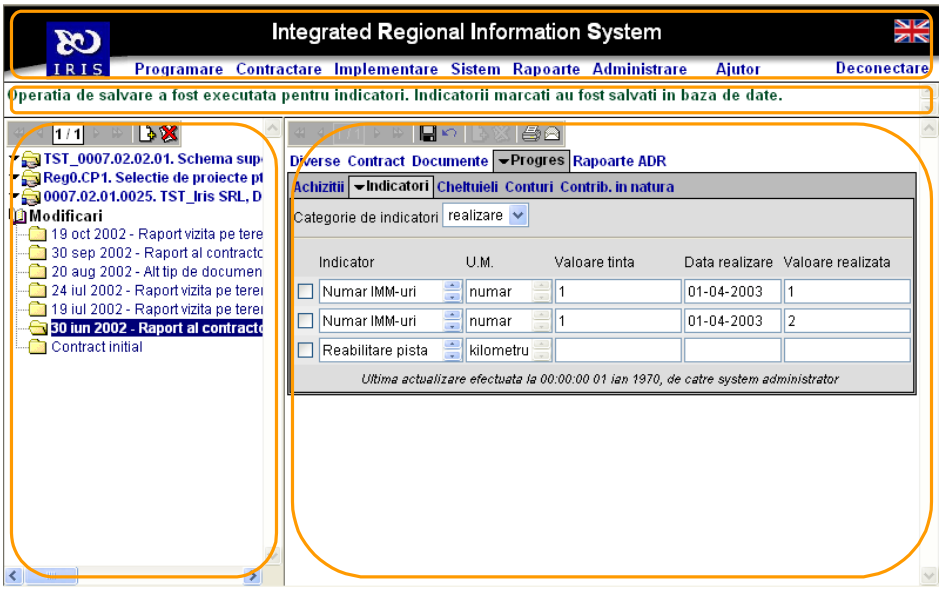
- Clients (natural and artificial persons);
- Identification cards;
- Enterprise Support (consulting, training, seminars) and Workspace Centers;
- Socio - economic data (quarterly and annual);
- Employment and training incentive scheme (employers and employees);
- Micro credits.

3. Projects developed by the Ministry of European Integration[12]

According to the EDIS (Extended Decentralized Implementation System) requirements, it is necessary to implement an IT system for the management of the PHARE programs (mainly) to address both to the central level (ministry) and the regional level (Regional Development Agencies).

This is a IT integrated system, which allows the monitoring of the regional development projects, being oriented mainly to "grant" projects, but permitting also the manipulation of technical assistance or even infrastructure projects, with a limited approach (the specific details of these projects are not covered).

The system can be accessed at http://80.86.103.228/iris/ or http://192.168.10.10/iris/, the latter being available from the ministry web site also.



The name of the system is **IRIS (Integrated Regional Information System)** and permits:

- The enhancing of the Ministry – Regional Development Agencies communication, offering quick and secure access to information;
- Transparency of the regional development PHARE projects management, representing also a "base" for the future Structural Funds;
- The fulfilment of requirements both for the RDAs and the Ministry activities;
- A simple, intuitive, easy to use approach; as a web based system, the users only need a web browser. Thus, the RDAs are relieved of installing/uninstalling client applications activities and, implicitly, of specific personnel;
- Local backup copies of the database, if needed, to avoid any possible malfunctions caused by the temporary loss of the Internet connection;
- A thorough "help" contextual system;
- The possibility of generating standard and specific reports with a system-integrated report generator.

[12] Source: Ministry of Communications and Information Technology

4. Projects developed by the Ministry of Public Finance[13]

The Information Technology General Division

At present the Information Technology General Division has attributions regarding the devlopment, implementation and exploitation of the Ministry IT system based upon the IT strategy of the Ministry, for an efficient implementation of the proper technical means in order to achieve the goals of the Strategy of MFP.

The overwhelming majority of the following subsystems were started once the corresponding regulatory framework was approved. Over the last three years, there were made significant efforts in order to develop the systems and to increase their efficiency through a unitary methodological approach and the use of standardized development instruments.

The IT projects developed by the Ministry of Public Finance cover the following areas:

A. Fiscal administration, with the subsequent subcomponents:

- Tax payers evidence– registries containing information regarding the liabilities to the state budget;
- The management of the tax payers declarations;
- Tax payer evidence comprises the fiscal standing of every tax payer
- Payments reschedule;
- Liquidation;
- Bad debts collection ;
- Control and the Tax Authority;
- Assistance to the taxpayer – through support programs offered at the premises of the fiscal authorities and Internet, on the Ministry's web site www.mfinante.ro.

B. The management of the State Treasury general account, with the subsequent subcomponents:

- Public accounting;
- State Treasury Management;
- Budgetary execution.

C. Budgetary process, with the subsequent subcomponents:

- Budgetary planning – the Budgetary planning IT subsystem assists the specialized personnel in order to work out different budget options, using the budgetary classification and information regarding the estimation of revenues, investments proposals, acquisitions, etc.
- Budget per programs;
- Monitoring the public acquisitions;
- Investments prioritisation.

D. Projects from other fields, such as:

- **Internal audit** - an IT subsystem assists the audit missions starting with the mission definition and ending with the preparing of the final documents; the project is in the testing phase in Bucharest and the central level.

[13] Sursa: Ministerul Comunicaţiilor şi Tehnologia Informaţiei

- **The Public Finance School (PFS)–** is an ***e-learning*** project for PFS and it is used for various curricula which involves organizing virtual classroom with the personnel form the territorial units.

5. Project developed by the National Authority of Pensions and other Social Security rights

The major objective of the Strategy for the modernization of the public pensions system in Romania – the implementation of a new IT system, fully integrated, which will allow the application of the reforming legislation, and especially of the Law 19/2000 regarding the public pensions system and other social security rights, represents one of basic concern of the managerial team of the National Authority of Pensions and other social security rights.

The project involves the complete informatisation of the three main subsystems of the National Authority of Pensions: the calculation and payment of pensions, evidence of contributions and the financial-accounting subsystem.

The system will have a positive influence over the quality of services rendered, including through a web site, which would ensure the integration in the national electronic system, along with the specific functions.

At present, the implementation process is still in progress and it should be operational at the end of the first trimester of 2004.

Annex 6 – List of Information Society Indicators

Indicator	Obs	Romania 2003*
Acces		
Internet penetration	% of the total population	20%
Internet penetration in the public administration	% of the no. of institutions central and local public institutions	80%
Degree of fixed telephony penetration	No. of land lines/total population	20%
	No. of land linestotal no. of households	58%
Internet access costs - population	Cost of access for 20 off-peak hours- dial-up including phone call costs	EUR 7.7
	The least expensive type of connection – population	Dial-up=3 EUR/month; Cable=7,8 EUR/month; ADSL=400 EUR/month; Radio=400 eur/month.
Internet access costs - companies	Cost of access for 40 peak hours - dial-up including phone call costs	EUR 29.2
	The least expensive type of connection - companies	Dial-up=5 EUR/month; Cable=7.8 EUR/month; ADSL=400 EUR/month; Radio=400 EUR/month.
Distribution of cable TV networks	No. of families connected/total no. of families	58%
No. of cable TV operators		690
Waiting time for the installments of a main land line (in years)		2.7 years
Degree of mobile telephony penetration	No. of subscribers / total population	32%
No. of mobile telephoy users		6,900,000
Cost of phone subscription for companies (EUR per month)		4.2
Cost of a local call (EUR - for 3 minutes)		0.093
Cost of a mobile telephony call during off-peak hours (EUR - for 3 minutes)		0.2 – 0.4
Cost of a residential phone subscription		EUR 3.5
No. of stallite communication operators		34 – fixed networks 7 – mobile networks
No. of Internet users		4,000,000**
No. of Internet users in 100 inhabitants		18.6%
No. of national domains		56,663
No. of national domain in 100 inhabitants		0.27
Host count by DNS Domains		82,095
No. of ISPs		392
Interconnection price (EURO centi)		1.15 / 10.17
Digitization degree of the fixed telephony network		74%
Weight of households that own 1 PC		11.6%
Total no. of PCs used in households		840,000
Total no. of PCs used in the business environment		1,000,000
Total no. of PCs used in the public administration		260,000
Total no. of PCs per 100 inhabitants		9,75

* The information for December 2003, if not otherwise indicated, represents estimates based on discussions with MCTI and specialzed associations, as well as on inferring public information available taking into consideration the trends described by the evolution of the respective indicators over the past 4 years;

** Estimated by means of a polynomial function using as base 2000 – 2002 values

Indicator	Obs	Romania 2003*
Education		
No. of education institutions with Internet access (for all connection types: dial-up, ISDN, ADSL, cable)	% of total no. of education institutions	6.5%
No. of education institutions where students have Internet access – primary schools / high-schools	% of total no. of education institutions	9.8%/68%
No. of students per PC in education institutions		6 /10/>50
No. of students per connected PC in education institutions		8.3/13.3/>100
No. of PCs with Internet connection in 100 studentd by level of education – tertiary/secondary/primary		12/7,5/>1
Traffic recorded on RoEduNet		- external 622 Mbps line is about 50% used / the Iasi and Cluj lines. of 34 Mbps each. are 100% used and Timisoara line.of 34 Mbps. is 70% used/ Craiova. Targu Mures and Galati lines. of 8 Mbps each. are 100% used
No. of (active) ITC specialists		
No. of employees in the ITC sector		
Total population employed		8,500,000
Public expenses for education (% of GDP)		4.0%
Society		
ITC househol expenses (EURO per month)		7.7
No. of PCs		2,100,000
Percentage of health institutions connected to the Internet		18%
Percentage of phisicians using the modern electronic systems for keeping patient evidence		50%
Percentage of phisicians using the Internet in communicating with patients		0.5% - 1%
Economy		
IT expenses per capita	EUR	35.5
Percentage of GDP consumed for the acquisition of ITC goods and services	%	1.60%
Service market size		128**
Equipment market size		1514**
Telecom market size	EUR billion	2.66
No. of IT companies		8,117***
Value of software exports	EUR million	200
Weight of ITC sectos in the Gross Added Value (GDP)		9%
No. of software producing companies	CAEN	6,070***
Micro		5,683***
Small		339***
Medium		46***
Large		2***

** According to forecasts of the EITO 2003 Study.

Indicator	**Obs**	**Romania 2003***
Percentage of Internet users that have shopped on-line	%	10***
Percetage of companies that use on-line purchasing, in the total numer of companies		5%***
Electronic commerce degree of utilization	% of the population	1.5%***
No. of active cards		4,334,000
No, of card accounts for employees		679,703
No. of ATMs		2,278
No. of POSs installed		8,810
Banks offering on-line banking services		23

Annex 7 – List of Tables Included in the Report;

Annex 7 – List of Tables Included in the Report;

Table 1. Conclusions of the EC Country Reports on Romania during 2000 - 2003 14
Table 2. The Action Plan for e-administration 18
Table 1. The evolution of the main economic indicators 22
Table 3. 22
Table 4. Evolution of Monthly Gross Average Salaries 24
Table 5. Comparative analysis of the communication expenses/household in 2002 25
Table 6. The Progress of Foreign Direct Investments in Romania: 1991 – 2003 27
Table 7. ICT sector analysis 32
Table 8. ICT sector analysis, sub-branch information 33
Table 9. Comparative Values of the Weight of R&D Expenses in GDP 35
Table 10. Comparative analysis of the eGovernment indicators recommended by the EU – Romania, the UK and Greece 66
Table 11. Total no. of Students in the Romanian Education System during the Academic Year 2002/2003 69
Table 12. Total No. of Connected Educational Institutions 75
Table 13. No of computers/100 students and no. of connected computers/100 students 75

Annex 8 – List of Graphs Included in the Report;

Annex 8 – List of Graphs Included in the Report;

Graph 1. Comparative Analysis of the GDP Growth Rate in Romania, Bulgaria, Hungary and Poland during 2000 - 2002 23
Graph 2. Evolution of the Average Gross Salary in Romania, Bulgaria, Hungary and Poland during 2000 - 2002 24
Graph 3. The Evolution of Foreign Trade between 1991 - Sept. 2003 26
Graph 4. The market share of the mobile telephony operators in Romania 30
Graph 5. The increase of the GSM operators' subscribers number in Romania during December 1999 – December 2003 ..... **Error! Bookmark not defined.**
Graph 6. ICT sector analysis, sub-branch information 33
Graph 7. Regional Distribution of the Turnover in ICT 34
Graph 8. Regional Distribution of the Turnover of Software Companies 34
Graph 9. Number of authorisations by type 52
Graph 10. The Evolution of Telephony Users 53
Graph 11. Geographic numbers reserved (million) 53
Graph 12. Types of fixed line telephony services 54
Graph 13. Weight of Internet users in total population 56
Graph 14. Call Costs (Eurocents/min) 57
Graph 15. The Evolution of ".ro" Domains (1999 – 2003) 77
Graph 16. The Number of PCs (2000 – 2003) 85
Graph 17. The Hardware Market During 2000 – 2003 86
Graph 18. The Distribution of PCs in Romania in 2002 87

Annex 9 – Bibliography;

Annex 9 – Bibliography;

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